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FOR PART A HEADQ (U) HAZARDOUS MATERIALS TECHNICAL
CENTER ROCKVILLE MD AUG 87 DLA900-82-C-4426

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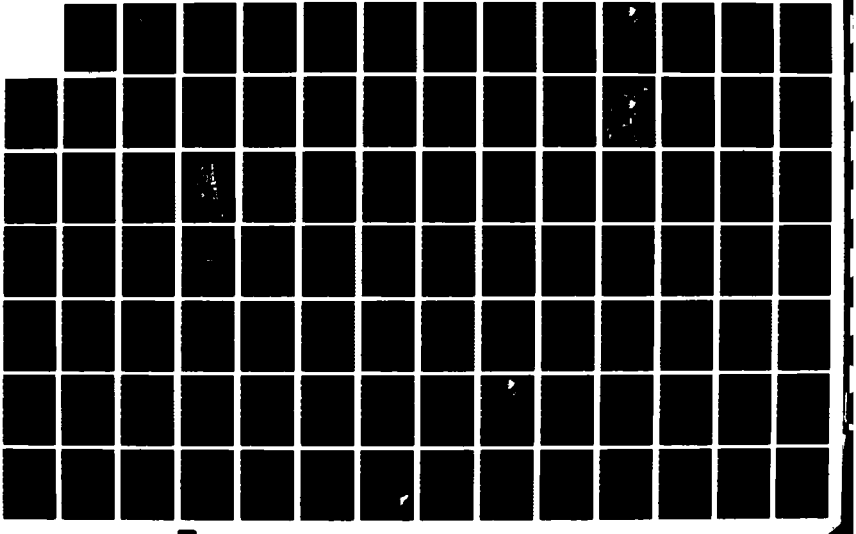

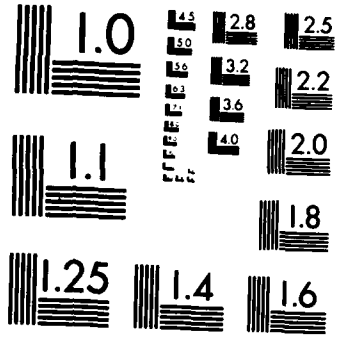

MICROCOPY RESOLUTION TEST CHART
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INSTALLATION RESTORATION PROGRAM

Phase I
Records Search

Part A
Headquarters, 117th Tactical Reconnaissance Wing
Alabama Air National Guard
Birmingham Municipal Airport
Birmingham, Alabama
and
Part B
226th Combat Information Systems Group
Martin Air National Guard Station
Gadsden Municipal Airport
Gadsden, Alabama

Hazardous Materials Technical Center
August 1987

This report has been prepared for the National Guard Bureau, Washington, DC, by the Hazardous Materials Technical Center for the purpose of aiding in the implementation of the Air Force Installation Restoration Program.

INSTALLATION RESTORATION PROGRAM
PHASE I - RECORDS SEARCH FOR

PART A

HEADQUARTERS 117th TACTICAL RECONNAISSANCE WING
ALABAMA AIR NATIONAL GUARD
BIRMINGHAM MUNICIPAL AIRPORT
BIRMINGHAM, ALABAMA

AND

PART B

226th COMBAT INFORMATION SYSTEMS GROUP
MARTIN AIR NATIONAL GUARD STATION
GADSDEN MUNICIPAL AIRPORT
GADSDEN, ALABAMA

August 1987

Prepared for

National Guard Bureau
Andrews Air Force Base, Maryland 20331-6008

Prepared by

The Hazardous Materials Technical Center
The Dynamac Building
11140 Rockville Pike
Rockville, Maryland 20852

Contract No. DLA 900-82-C-4426

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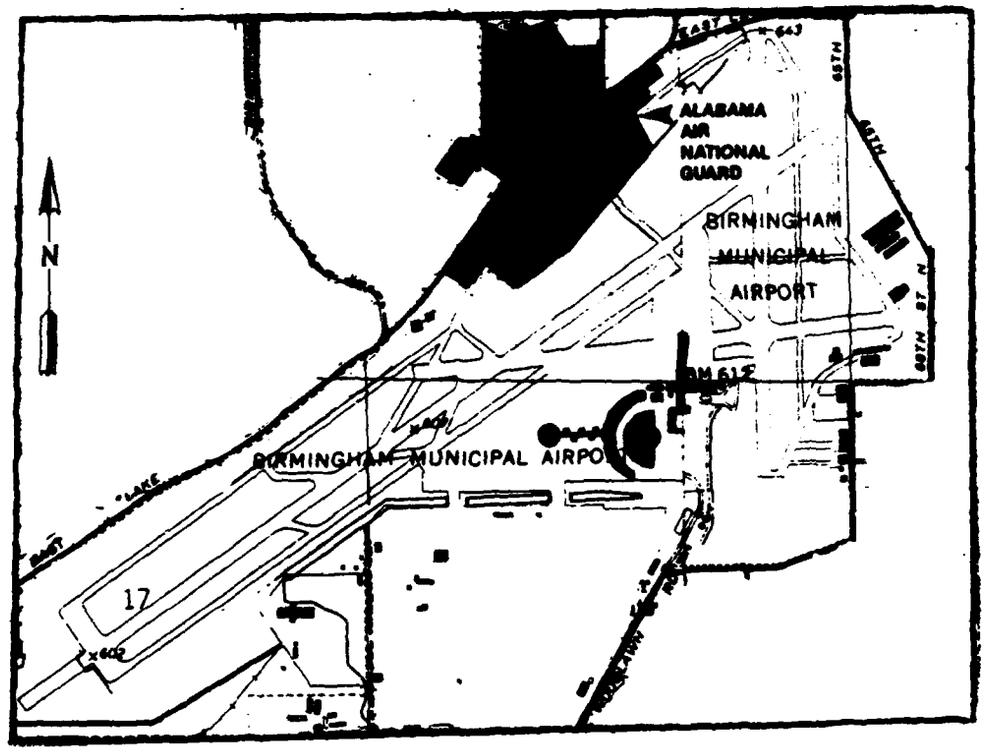
INSTALLATION RESTORATION PROGRAM

Phase I
Records Search

Part A

Headquarters, 117th Tactical Reconnaissance Wing
Alabama Air National Guard
Birmingham Municipal Airport
Birmingham, Alabama

Hazardous Materials Technical Center
August 1987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INSTALLATION RESTORATION PROGRAM
PHASE I - RECORDS SEARCH FOR

HEADQUARTERS 117th TACTICAL RECONNAISSANCE WING
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EXECUTIVE SUMMARY

A. INTRODUCTION

The Hazardous Materials Technical Center (HMTC) was retained in November 1986 to conduct the Installation Restoration Program (IRP) Phase I - Records Search of the 117th Tactical Reconnaissance Wing (TRW), Alabama Air National Guard, Birmingham Municipal Airport, Birmingham, Alabama, hereinafter referred to as the Base, under Contract No. DLA 900-82-C-4426 (Records Search). The Records Search included:

- an onsite visit including interviews with 22 Base employees conducted by HMTC personnel during the period 5-7 November 1986;
- the acquisition and analysis of pertinent information and records on hazardous materials use and hazardous waste generation and disposal at the Base;
- the acquisition and analysis of available geologic, hydrologic, meterologic, and environmental data from pertinent Federal, State, and local agencies; and
- the identification of sites on the Base which may be potentially contaminated with hazardous materials/hazardous waste.

B. MAJOR FINDINGS

The major operations of the 117th TRW that have used and disposed of hazardous materials/hazardous waste include aircraft maintenance, ground vehicle maintenance, and fire department training. The operations involve such activities as corrosion control, nondestructive inspection (NDI), fuel cell maintenace, engine maintenance, and pneudraulics. Varying quantities of waste oils, recovered fuels, spent cleaners, strippers, and solvents were generated and disposed of by these activities.

Interviews with 22 Base personnel and a field survey resulted in the identification of 10 disposal and/or spill sites on the Base. Of the 10 sites, 3 are potentially contaminated with hazardous materials/hazardous waste; they are

listed as follows:

- o Site No. 1 - Abandoned Temporary Storage Area
- o Site No. 7 - Old Firing Range Area
- o Site No. 8 - Burial Site Northeast of Building 202

Site Nos. 7 and 8 revealed no observable environmental stress resulting from past spills and/or disposal of hazardous wastes.

C. CONCLUSIONS

The three hazardous materials/hazardous waste sites identified as potentially contaminated are Site Nos. 1, 7, and 8. These sites have been further evaluated and given a Hazard Assessment Score (HAS), utilizing the Air Force Hazard Assesement Rating Methodology (HARM).

Site No. 1 - Abandoned Temporary Storage Area (HAS-51)

For approximately 16 years, this area was used as a temporary storage area for 55-gallon drums of hazardous materials/hazardous waste. Materials included oil, paint, paint thinner, and paint stripper.

Site No. 7 - Old Fire Range Area (HAS-43)

In the late 1960's, a hole was excavated in this area and the contents of a number of 55-gallon drums and 5-gallon cans were dumped into the hole and covered.

Site No. 8 - Burial Site Northeast of Building 202 (HAS-50)

Between 1965 and 1970, a hole was excavated by a backhoe and the contents of a number of 55-gallon drums and 5-gallon cans were emptied into the excavation prior to backfilling.

D. RECOMMENDATIONS

Because of the potential for contaminant migration, initial investigative stages of the IRP Phase II/IVA are recommended for the three sites that are potentially contaminated with hazardous materials/hazardous waste. The primary purpose of the subsequent investigations are listed as follows:

1. To determine whether pollutants are present at each site, or determine that no pollutants are present.

2. To determine whether groundwater at each site has been contaminated, and if it has, give quantification with respect to contaminant concentrations, the boundary of the contaminant plume, and the rate of contaminant migration.

At Site Nos. 1, 7, and 8 the exact locations of the contamination are not known; therefore, it is recommended that the initial investigation consist of an appropriate geophysical technique to detect the probable location of subsurface hydrocarbons, organics, solvents, and buried drums. If the geophysical monitoring indicates potential contamination, subsequent IRP Phase II/IVA investigations at these locations should be implemented.

I. INTRODUCTION

A. BACKGROUND

The 117th Tactical Reconnaissance Wing (TRW) is located at the Alabama Air National Guard, Birmingham Municipal Airport, Birmingham, Alabama, hereinafter referred to as the Base. The Air National Guard Base has been active since 1922, and over the years the types of military aircraft based and serviced there have varied. Both past and present operations have involved use of hazardous materials and disposal of hazardous wastes. Because of the use of hazardous material and disposal of hazardous wastes the Air National Guard (ANG) has implemented its Installation Restoration Program (IRP). The IRP is a four-phase program as follows:

Phase I - Records Search (Installation Assessment) - to identify past spill or disposal sites posing a potential and/or actual hazard to public health or the environment.

Phase II/IVA - Site Characterization/Remedial Action Plan - to define and quantify the presence or absence of contamination that may have an adverse impact on public health or the environment via field studies, to develop a Remedial Action Plan (RAP), and if directed by the National Guard Bureau, preparing designs and specifications.

Phase III - Technology Base Development (if needed) - to develop new technology to accomplish remediation.

Phase IVB - Implementation of Site Remedial Action.

B. PURPOSE

The purpose of this IRP Phase I - Records Search (hereinafter referred to as Records Search) is to identify and evaluate suspected problems associated with past hazardous waste handling procedures, disposal sites, and spill sites on the Base and to assess the potential for the migration of hazardous contami-

nants. HMTC visited the Base, reviewed existing environmental information, analyzed the Base records concerning the use and generation of hazardous materials/hazardous waste, and conducted interviews with past and present Base personnel who are familiar with past hazardous materials management activities. Relevant information collected and analyzed as a part of the Records Search included the history of the Base, with special emphasis on the history of the shop operations and their past hazardous materials/hazardous waste management procedures; the local geological, hydrological, and meterological conditions that may affect migration of contaminants; local land use, public utilities, and zoning requirements that affect the potentiality for exposure to contaminants, and the ecological settings that indicate environmentally sensitive habitats or evidence of environmental stress.

C. SCOPE

The scope of this Records Search is limited to the Base and includes the following:

- o An onsite visit;
- o The acquisition of pertinent information and records on hazardous materials use and hazardous wastes generation and disposal practices at the Base;
- o The acquisition of available geologic, hydrologic, meterologic, land use and zoning, critical habitat and utility data from various Federal, State, and local agencies;
- o A review and analysis of all information obtained; and
- o The preparation of a report, to include recommendations for further actions.

The onsite visit, interviews with past and present personnel, and meetings with local agency personnel were conducted during the period 5-7 November 1986. The HMTC Records Search Team consisted of the following individuals (Resumes are included as Appendix A):

- o Ms. Jody C. Mooney, Environmental Scientist
- o Mr. Bradley Hilton, Program Manager

Individuals from the ANG who assisted in the Records Search include Mr. Arthur Lee, Environmental Engineer, ANGSC/DEV, and selected members of the 117th TRW. The Point of Contact at the Base was Lt. Waylon D. Blakeley, Base Environmental Coordinator.

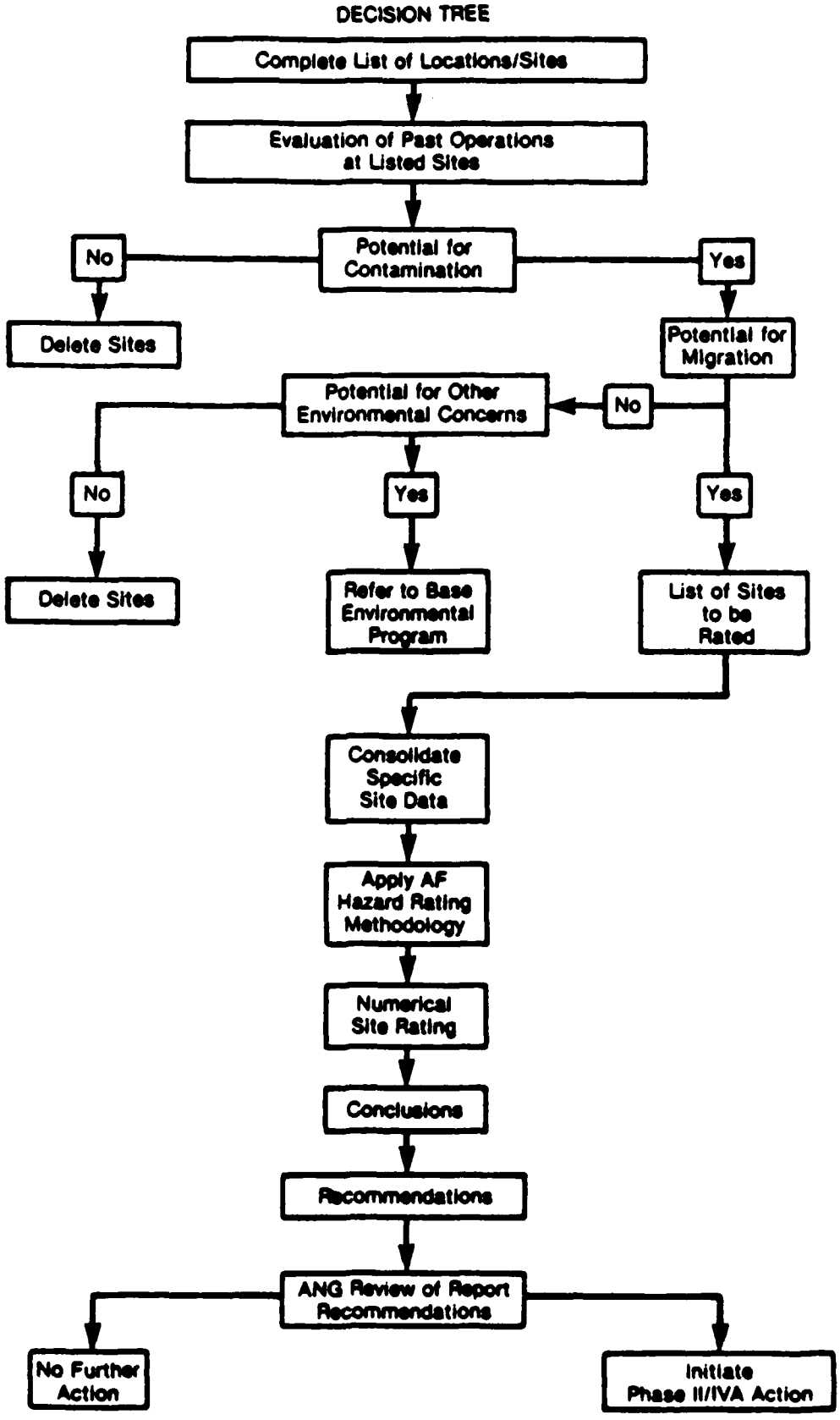
D. METHODOLOGY

A flow chart of the Records Search Methodology is presented in Figure 1A. This Records Search Methodology to the greatest extent possible, ensures a comprehensive collection and review of pertinent site specific information, and is utilized in the identification and assessment of potentially contaminated hazardous waste spill/disposal sites.

The Records Search began with a site visit to the Base to identify all shop operations or activities that may have utilized hazardous material or generated hazardous waste. Next, an evaluation of past and present hazardous materials/hazardous waste handling procedures at the identified locations was made to determine whether environmental contamination may have occurred. The evaluation of past hazardous materials/hazardous waste handling practices was facilitated by extensive interviews with 22 past and present employees familiar with the various operating procedures at the Base. These interviews were also utilized to define the areas on the Base where any waste materials, either intentionally or inadvertently, may have been used, spilled, stored, disposed of, or released into the environment.

Appendix B lists the interviewee's principal areas of knowledge and their years of experience with the Base. Historical records contained in the Base files were collected and reviewed to supplement the information obtained from interviews. Using the information outlined above, a list of waste spill/disposal sites on the Base was identified for further evaluation. A general survey tour of the identified spill/disposal sites, the Base, and the surrounding area was conducted to determine the presence of visible contamination and to help the HMTC survey team assess the potential for contaminant migration. Particular attention was given to locating nearby drainage ditches, surface water bodies, residences, and wells.

Figure 1A.
Records Search Methodology Flow Chart.



Detailed geological, hydrological, meterological, developmental (land use and zoning), and environmental data for the area of study were also obtained from appropriate Federal, State and local agencies as identified in Appendix C. Following a detailed analysis of all the information obtained, it was determined that three of the ten identified sites were potentially contaminated with hazardous materials/hazardous waste, and the potential for contaminant migration existed. These sites were numerically scored utilizing the Air Force Hazard Assessment Rating Methodology (HARM). Recommendations for follow-up investigations of the three potentially contaminated sites were developed.

II. INSTALLATION DESCRIPTION

A. LOCATION

The 117th TRW is located at the Birmingham Municipal Airport, Birmingham, Alabama, approximately 5 miles northeast of downtown Birmingham, Alabama. The 117th TRW occupies the area between Burgin Avenue and 57th Street N., off East Lake Boulevard. Figure 2A shows the location and boundaries of the Base covered in the Records Search.

B. ORGANIZATION AND HISTORY

On 21 January 1922, the organization was federally recognized as the 135th Observation Squadron, Alabama National Guard. The missions and types of aircraft have varied over the years, beginning with the arrival of seven Curtiss JN-4Ds.

Authorized aircraft during the pre-World War II period included the Douglas O2-H, Consolidated TW-3 (PT-1), Curtiss O-11, Consolidated O-17, Thomas Morse O-19, Douglas O-38B, North American O-47, Curtiss O-1A, and North American BC-1A.

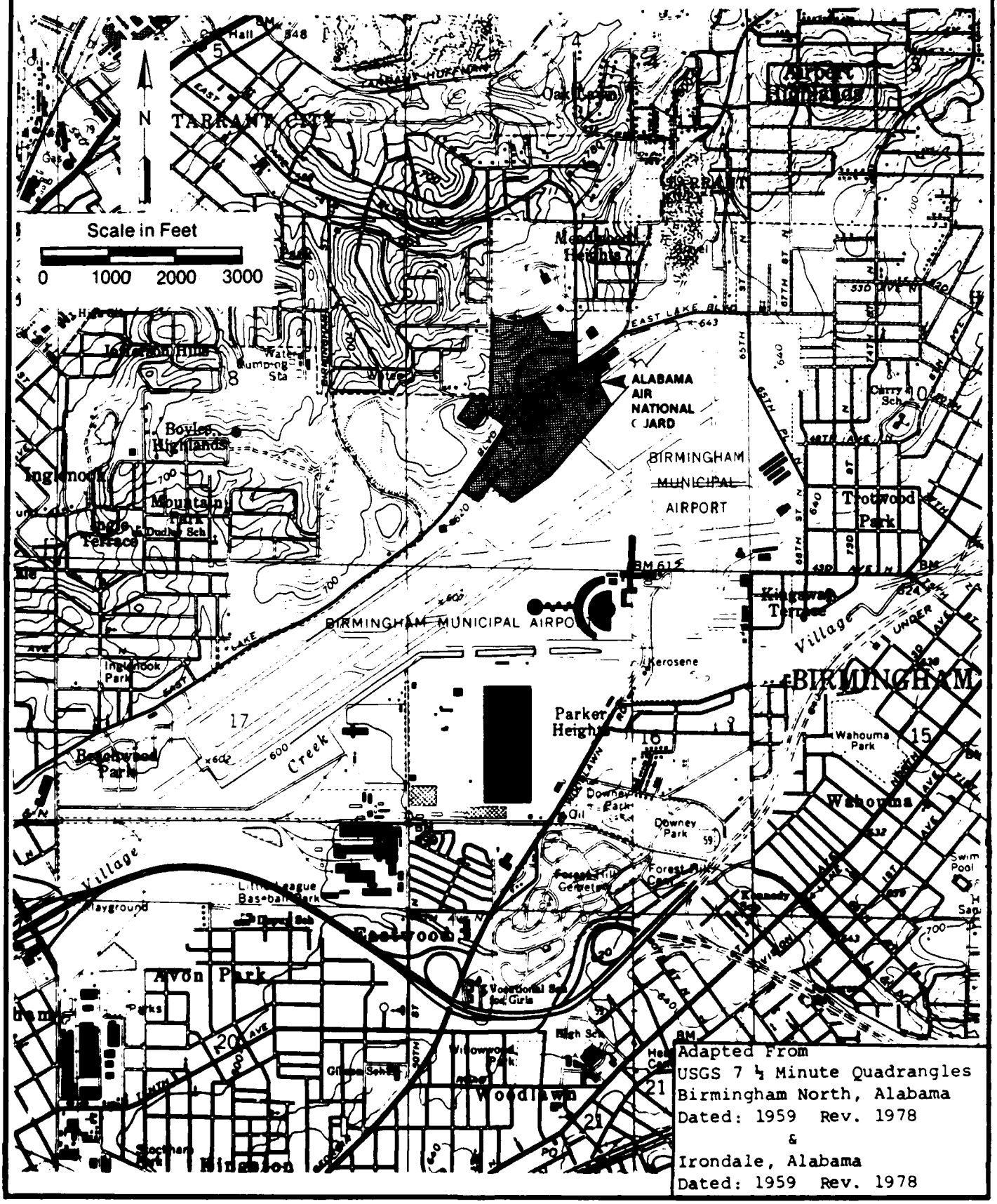
In 1938 with construction completed, the unit moved into its present quarters at the Birmingham Municipal Airport. The Air National Guard facility at Birmingham was named after the late Colonel Sumpter Smith, who had an important part in promoting the construction and development of the Birmingham Municipal Airport. On 12 December 1941, 5 days after the attack on Pearl Harbor, the unit was moved to Miami, Florida to perform anti-submarine patrol. Unit equipped aircraft varied considerably and included the North American O-47, Stinson O-49, Douglas DB-7, Douglas A-20, Bell P-39, Curtiss P-40, Seversky (Republic) P-43, Stinson L-5, and the Aeronca L-6. Following World War II, the unit returned to Fort Sumpter Smith Air National Guard Base, and to reserve status.

Jets arrived in Birmingham in mid-1957, when the official unit designation was changed to 106th Tactical Reconnaissance Squadron (TRS). The 106th TRS and

HMTC

Figure 2A.

Site Map of Alabama ANG , Birmingham Municipal Airport, Birmingham, Alabama



the 117th TRW were recalled to active duty in October 1961, during the Berlin crisis. The 106th deployed 20 RF-84s from Birmingham to Dreux, France.

In August 1964, 12 Birmingham-based RF-84F jets performed a non-stop transatlantic flight. The flight proved that the 106th TRS was ready to be deployed to foreign countries within a matter of hours, in the event of a crisis.

On 24 February 1971, the 106th TRS received the RF-4C Phantom II, the most sophisticated reconnaissance aircraft in the Air Force inventory.

The reconnaissance mission of the 106th TRS has not changed since 1971.

III. ENVIRONMENTAL SETTING

A. METEROLOGY

Precipitation in Jefferson County, Alabama averages 53.65 inches annually, based on the 30-year interval, 1931 to 1960. By calculating net precipitation according to the method outlined in the Federal Register (47 FR 31224, 16 July 1982), a net precipitation value of 11.65 per year is obtained. Rainfall intensity, based on 1-year frequency, 24-hour duration rainfall, is 3.5 inches (calculated according to 47 FR 31235, 16 July 1982, Figure 8).

B. GEOLOGY

1. Regional Geology

The Base at Birmingham Municipal Airport is located within the Ridge and Valley Physiographic Province, approximately 5 miles southeast of the Cumberland Plateau Physiographic Province. The geologic materials which comprise this region consist primarily of consolidated sedimentary rocks such as carbonates, siltstones, sandstones, and shales deposited between the Cambrian (600 million years ago) and Pennsylvanian (286 to 320 million years ago) Periods. Unconsolidated deposits of sand and gravel occur along the numerous stream and river valleys (Moffett and Moser, 1978).

Due to ancient southeast-northwest compressive forces, the originally flat-lying sedimentary rocks in the Birmingham area have become strongly folded, thus forming northeastward-southwestward-oriented ridges and valleys. To the northwest of Birmingham, these ancient compressive forces rapidly diminished, and the rocks of the Cumberland Plateau maintain their original horizontal orientation for the most part.

2. Local Geology

The geologic formation which directly underlies the Base is the Knox Dolomite. Butts (1910) describes the Knox Dolomite as a thick-bedded crystalline dolomite with dense compact chert in layers, stringers, and nodules. Typi-

cally, the Knox Dolomite is light gray in color, 40 to 43 percent magnesium carbonate, and 56 percent calcium carbonate.

Soils at the Base are predominantly of the Bodine-Fullerton association and Urban land (Spivey, 1980). The Urban land accounts for the majority of Base property, while the Bodine-Fullerton association accounts for a small area northeast of the Base. The Urban land has been altered to achieve large areas that are nearly level, to avoid flooding or wetness problems, or to increase the load-supporting capacity. The original soil was altered by cutting and filling, shaping and grading, excavating, blasting, compacting, or covering with concrete or asphalt.

Typically, the surface layer of Bodine soils is brown cherty silt loam about 4 inches thick. The subsoil is more than 68 inches thick. The upper 8 inches is yellowish-brown, very cherty loam; the next 24 inches is strong brown, very cherty loam; and the lower 36 inches is yellowish-red, very cherty clay loam.

Typically, the surface layer of Fullerton soils is brown cherty silt loam about 5 inches thick. The subsurface layer is yellowish-brown, cherty silt loam, about 5 inches thick. The subsoil is cherty clay loam, more than 50 inches thick. The upper 26 inches is yellowish-red, and the lower 24 inches is red. In some areas, soils are similar to Fullerton soils except that they either have a clay loam texture or have a yellower subsoil and are generally on foot slopes and colluvial fans.

Permeability for Bodine soils ranges from 1.41×10^{-3} to 4.23×10^{-4} cm/sec, and for Fullerton soils, 4.23×10^{-4} to 1.41×10^{-3} cm/sec. Bodine soils have a low shrink-swell potential. Surface runoff is rapid. If these soils do not have a plant cover, sheet and rill erosion is very severe for Bodine soils and severe for Fullerton soils. Both soils are strongly to very strongly acid.

Minor soils in this association are Allen and Etowah soils, on uplands that have firm plastic, slow permeable subsoils. Other soils in the map unit are Ketona soils and cherty soils on flood plains and in sinkholes.

C. HYDROLOGY

1. Surface Water

As determined by the Federal Emergency Management Agency, the Base is within the boundaries of a floodplain associated with 100-year frequency floods. Storm drainage from the Base is routed across the Birmingham Municipal Airport into an underground storm sewer and discharged in Village Creek.

2. Groundwater

Groundwater occurs at depths of less than 15 feet as evidenced by shallow soil test borings installed at the Base in conjunction with new building construction. Except for the possibility of shallow, perched water-bearing zones within the unconsolidated soils, the majority of the groundwater occurs within fracture zones within the Knox Dolomite. Because the primary porosity of the Knox Dolomite is nearly zero, the occurrence and movement of groundwater is completely controlled by the occurrence of fractures.

According to Moffett and Moser (1978), most of the groundwater wells located in the Birmingham area range in depth from 20 to 620 feet, although 80 percent are less than 300 feet in depth. Reported yields of domestic wells range from 2 to 22 gallons per minute. Based on the topographic setting of the Base, the groundwater flow direction is probably toward the west-southwest.

Groundwater is not the domestic water source in the Birmingham area. People living within a three mile radius of the Base obtain their drinking water from the Birmingham Water Works Board. The municipal water supply is provided from three surface water sources: Inland Lake, Smith Lake, and the Cahaba River. The water source nearest to the Base is the Cahaba River approximately 20 miles to the east. Personnel with the Water Works Board Distribution Department, are not aware of any active domestic wells within the service area around the Birmingham Municipal Airport.

IV. SITE EVALUATION

A. ACTIVITY REVIEW

A review of Base records and interviews with present Base employees resulted in the identification of specific operations within each activity in which the majority of industrial chemicals are handled and hazardous wastes are generated. Table 1A summarizes the major operations associated with each activity, provides estimates of the quantities of waste currently being generated by these operations, and describes the past and present disposal practices for the wastes. If an operation is not listed in Table 1A, then that operation has been determined on a best-estimate basis to produce negligible (less than 5 gallons per year) quantities of wastes requiring ultimate disposal. For example, an activity may use small volumes of methyl ethyl ketone. Such quantities commonly evaporate during use, and therefore do not present a disposal problem. Conversely, if a particular volatile compound is listed, then the quantity shown represents an estimate of the amount actually disposed of according to the method shown.

B. DISPOSAL/SPILL SITE IDENTIFICATION, EVALUATION, AND HAZARD ASSESSMENT

Interviews with 22 Base personnel (Appendix B) and subsequent site inspections resulted in the identification of 10 disposal/spill sites. Of these 10 sites, it was determined that 3 of the sites are potentially contaminated with hazardous materials/hazardous waste with a potential for migration. Therefore, they should be further evaluated. These sites were scored using HARM (see Appendix D). Figure 3A illustrates the locations of the scored/unscored sites. Copies of the completed Site Hazard Assessment Rating Forms are found in Appendix E. Table 2A summarizes the Hazard Assessment Scores (HAS) for each of the scored sites.

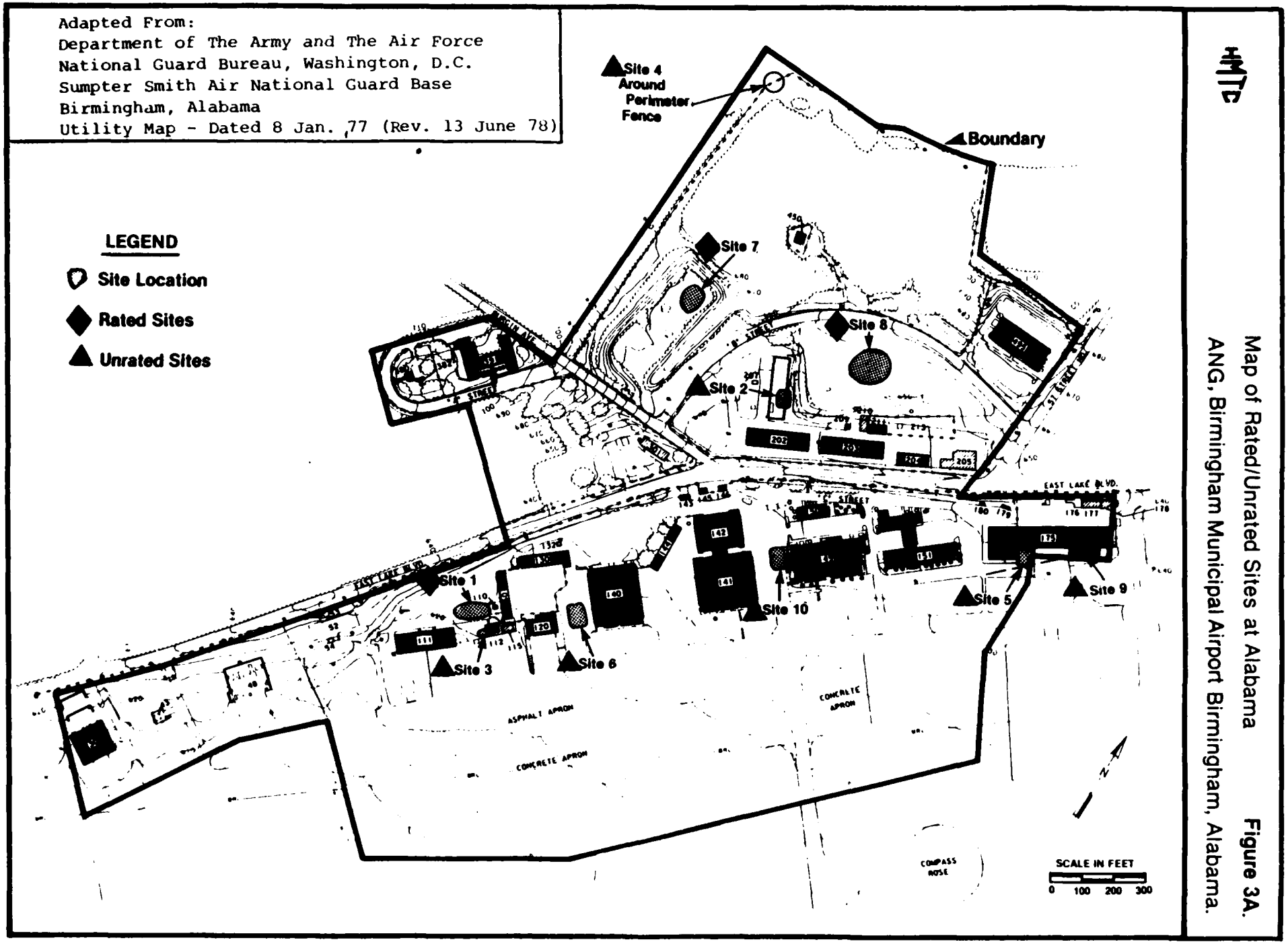
Table 1A. Hazardous Materials/Hazardous Waste Disposal Summary:
Alabama ANG, Birmingham Municipal Airport, Birmingham, Alabama

Shop	Building No. (Past & Present)	Hazardous Materials/ Hazardous Waste	Estimated Quantities (Gal/Year)	Method of Treatment/Storage/Disposal* 1950	1960	1970	1980	1986
Electric	142	Oil (turbine-synthetic)	10	----------FTA----------			'DRMO-------	
		PD-680	180	----------FTA----------			'DRMO-------	
Pneudraulics	142	PD-680	190				'DRMO-------	
		Oil (hydraulic)	Unknown	----------FTA----------			'DRMO-------	
NDI-Laboratory	142	Fluorescent Penetrant	40	----------S.D.----------			'DRMO-------	
		Oil (turbine-synthetic)	Unknown	----------REC.----------			'DRMO-------	
Repair Reclamation	142	Paint Stripper	50				'DRMO-------	
		PD-680	60	----------FTA----------			'DRMO-------	
Engine	111	PD-680	15				'DRMO-------	
AGE Complex	40	PD-680	50				'DRMO-------	
		Oil (hydraulic)	216	----------FTA----------			'DRMO-------	
		Oil (turbine-synthetic)	102	----------FTA----------			'DRMO-------	
		Oil (crank case)	50	----------FTA----------			'DRMO-------	
Corrosion Control	30	Paint	55				'DRMO-------	
		Paint Stripper	10				'DRMO-------	
		JP-4	240	----------FTA----------				
Motor Pool	130	Paint Thinner	Unknown	'----------F.P.----------			'DRMO------	
		Motor Oil	1,500	'----------F.P.----------			'DRMO------	
		Motor Oil	15	'----------F.L.----------			' FTA------	
		DS-2	15	'----------F.L.----------			'DRMO------	
		JP-4	15	'----------F.L.----------			' FTA------	
		JP-4	100	'----------FTA----------			'DRMO------	
		Paint Stripper	Unknown	'----------S.D.----------			'DRMO------	
Photographic Processing	175	Photographic Developer and Fixer	350	'----------D.D.-------'				
Interpretation Facility	149 202, 205 495	Photographic Developer and Fixer	350				'S.S.----------	

*Legend

F.P. - Fuel Pit
F.L. - Fence Line
S.D. - Storm Drain
FTA - Fire Training Area (Offsite)

DRMO - Disposed of by Defense Reutilization and Marketing Office - (Prior to 1985 disposal was by the Defense Property Disposal Office - DPDO)
D.D. - Drainage Ditch that flows into Village Creek
REC. - Recycle
S.S. - Sanitary Sewer



Map of Rated/Unrated Sites at Alabama ANG, Birmingham Municipal Airport Birmingham, Alabama. **Figure 3A.**

Table 2A. Site Hazard Assessment Scores (as Derived from HARM): Alabama ANG, Birmingham Municipal Airport, Birmingham, Alabama

Site Priority	Site No.	Site Description	Receptors	Waste Characteristics	Pathway	Waste Mgmt. Practices	Overall Score
1	1	Abandoned Temporary Storage Area	19	80	61	.95	51
2	8	Burial Site Northeast of Building 202	22	60	67	1.00	50
3	7	Old Firing Range Area	22	40	67	1.00	43

Site No. 1 - Abandoned Temporary Storage Area (HAS-51)

From 1950 to 1968, the area adjacent to Building 130 was used as a temporary storage area for 55-gallon drums of hazardous materials/hazardous waste. Such waste included oil, paint, paint thinner, and paint stripper. If the contractor did not show up in a timely fashion, the contents of the drums were then disposed of (dumped) in this area. Exact quantities of hazardous waste/hazardous materials involved are not known; however, the accumulation of materials over many years could be significant (in excess of 5,000 gallons). This area is now an asphalt parking lot. Prior to the construction of the parking lot, there were no soil samples taken. Because of the large quantity of oils, paint, thinners, and strippers which are suspected to have been disposed of in this area, a HAS was determined and subsequent Phase II/IVA IRP work is recommended.

Site No. 2 - Current Waste Storage Area (Unrated)

The current waste storage facility has been utilized since 1968 and is behind Building 202. It consists of an open concrete pad with no containment structures. Drums were observed being stored both on their sides and in an upright position, with accumulations of precipitation on the upright drums. The shop wastes that are stored here include PD-680, hydraulic fluid, and waste oils. No spills were noted at the site. There was visible evidence of routine drippings and seepage scattered around the concrete slab, but no evidence of any accumulation of waste material. Because of the small amount of material estimated to have been lost at this site (less than 10 gallons), a HAS and further evaluation at this site was deemed unnecessary.

Site No. 3 - Oil Changing - Flush Out Fuel Tank Area (Unrated)

From 1965 through 1968, Base personnel used the area west of Building 112 for changing oil filters and flushing out fuel tanks of aircraft prior to repairs. The aircraft were positioned over an existing fuel pit and drained into the pit (average of 50 gallons per aircraft), about 20 aircraft/year were serv-

iced in this area resulting in approximately 1,000 gallons per year. The fuel pit had a drain valve and discharge line running to Village Creek. The oil and fuel would usually be recovered from the pit for use in fire training activities. If the oil and fuel were not recovered from the pit, it would seep into Village Creek through a leak in the drain valve. Thus, only a small amount of waste fuel and oil would have accumulated in the soil at this site. This area is currently utilized as a parking lot and is covered with asphalt. Since the potential for contaminant migration from the soil is controlled by the asphalt cover, a HAS was not developed and further IRP work is not recommended.

Site No. 4 - Weed Control Around the Perimeter Fence (Unrated)

About 15 to 20 gallons/year of used motor oils and JP-4 were sprayed around the perimeter fence for weed control from 1953 until 1968. Because of the small amount of oil used and the fact that this occurred 18 years ago, it was decided that this site did not require HAS or further study.

Site No. 5 - Underground Tanks South of Building 175 (Unrated)

Underground tanks may be in the ground adjacent to Building 175. This location is presently a parking lot, and the cracked asphalt shows an outline of what may have been the location of two tanks. Base personnel have no records to indicate whether the tanks are full or empty, or if the tanks were removed. However, the cracked asphalt would seem to indicate the tanks were removed and the cracking was caused by the settlement of material used to backfill the site. Building 175 is utilized as the supply building and associated shipping and receiving activities. There is no indication that any hazardous waste/hazardous material was ever utilized or spilled at this site. Accordingly, it was determined that a HAS and subsequent IRP analysis was not required.

Site No. 6 - The Wash Rack Area (Unrated)

The wash rack area, adjacent to Building 140 was used between 1946 until 1971 as a paint stripping area. Normal practice at this site included flushing

the stripper into the storm drain culvert, which discharged off the Base into Village Creek. The paint and stripper which may have been accumulated in the culvert, for the most part, would be diluted and discharged into Village Creek during the flushing operations and subsequent storm events. Remaining contaminants in the culvert, if any, would have been further immobilized by the backfilling of this storm drainage culvert. Thus, even though the amount of stripper which may have been discharged into the storm drain channel is unknown, the potential for contamination from this site is minimal. Accordingly, a HAS for this site was not required and subsequent IRP analysis is not recommended.

Site No. 7 - Old Firing Range Area (HAS-43)

The old firing range area, located off Burgin Avenue and "B" Street, was used as a burial site for liquid waste. In the late 1960's, a hole was excavated in this area and the contents of a number of 5-gallon cans and 55-gallon drums were dumped into the hole and covered. There are no records to indicate what wastes may have been disposed of in this area. No reliable estimates of the total quantity of waste disposed of at this site could be determined since many of the cans were reported to have been partially filled or containing rain water. The interviewee who participated in this burial operation indicated that the disposal operation was a significant effort but, in HMTC's opinion, it is unlikely that more than 85 drums of material were disposed of at this site, since the area is in a wooded area and a similar disposal operation also occurred on another site at approximately the same time. The exact location of this site could not be determined during the site visit. Because of the quantity of waste disposed and the possibility that this waste may contain persistent contaminants, a HAS was developed and additional IRP analysis is recommended.

Site No. 8 - Burial Site Northeast of Building 202 (HAS-50)

This site is located northeast of Building 202 and consists of an open field which was used once between 1965 to 1970, as a burial site for liquid wastes. As at Site No. 7, a hole was excavated with a backhoe and the contents

of a number of 5-gallon cans and 55-gallon drums were emptied into the excavation prior to backfilling. There are no records to indicate the type and quantity of waste liquids disposed of in this manner. This area is more accessible than Site No. 7, and therefore, is assumed to contain more material. However, based on reported waste generation rates from various Base operations (see Table 1A), it is unlikely that more than 4,000 gallons of material would have been disposed of in this site. An inspection of the disposal area showed no ground depression, which would help to identify the exact location or size of the disposal site. A HAS was determined and subsequent IRP analysis is recommended for this site, because of the estimated quantity of the waste materials buried.

Site No. 9 and 10 - Photographic Developer and Fixer Discharge (Unrated)

Site No. 9 and 10 are addressed together because each site is where Photographic Developer and Fixer was discharged. Site No. 9 is southeast of Building 175, and Site No. 10 is southwest of Building 149. The developer/fixer solution was dumped from 1970 to 1973 into a drainage ditch, which is now covered, that emptied into Village Creek. During the personnel interviews, it was determined that up to 5,000 gallons per year of diluted developer/fixer solution (14 parts of water/1 part commercial strength solution), was discharged into the drainage ditch after treatment for recovery of silver. Although commercial strength photographic developer and fixer solutions are corrosive, the solution discharged at these sites was a diluted solution which

a) would have been further diluted by water in the drainage channel and Village Creek, and

b) would have been neutralized by the carbonates in the soil along the drainage channel and in the soil utilized to backfill the drainage channel.

Thus, these sites would not currently be contaminated with hazardous materials. A HAS and subsequent IRP investigations are, therefore, not required.

C. CRITICAL HABITATS/ENDANGERED OR THREATENED SPECIES

Discussions with personnel from the United States Department of the Interior, Fish and Wildlife Service, disclosed that there are no indigenous, endangered, or threatened species of flora or fauna in the vicinity of the Base. There are no critical habitats, wetlands, or wilderness areas within a radius of one mile from the Base.

D. OTHER PERTINENT FACTS

- Sanitary sewage is municipally treated.
- There are no active or inactive landfills on the Base. An old city landfill was adjacent to and upgradient of the Base. Refuse has been removed from this landfill and the area is currently under development.
- Waste oils have not been reported to be used for road dust control on the Base.
- To date, no environmental monitoring has been conducted on the Base.
- Radioactive waste has never been disposed of on the Base.
- There have never been any known leaks of PCB-contaminated oils from electrical transformers or capacitors on the Base.
- There are no past or current Fire Training Areas (FTA) on the Base. However, the city and ANG have utilized FTA's on city property. An old FTA was abandoned in 1979. The new FTA has been in continuous use since 1979.
- Waste JP-4 is used for the Fire Training Area (FTA) on city property.
- There has not been extensive use or storage of any pesticides or fertilizers on the Base.
- There are no active water wells on the Base. Two wells on the Base were abandoned prior to 1976.

V. CONCLUSIONS

- Information obtained through interviews with 22 Base personnel, review of Base records, and field observations have resulted in the identification of 10 disposal and/or spill sites at the Base. Three of the ten sites are potentially contaminated with hazardous materials/hazardous waste and further IRP analysis should be performed.

- Three of the ten potential sites (Site Nos. 1, 7, and 8) have been scored, using the Air Force HARM.

- Seven sites (Site Nos. 2, 3, 4, 5, 6, 9 and 10) were eliminated from further study because it was concluded that they exhibit no potential for contaminant migration and, therefore, pose no significant hazards to health and welfare.

- As a result of our field investigation, it was determined that no sites exhibit visible environmental stress.

VI. RECOMMENDATIONS

There is potential for contaminant migration at the Base; therefore, initial steps of the IRP Phase II/IVA are recommended. The purpose of the recommendations made in this report is to confirm or refute the presence of contamination at the sites. If confirmation is made, subsequent investigation via Phase II/IVA efforts should be accomplished in order to fully characterize the extent of any soil and groundwater contamination. Requirements for those efforts will be outlined in the Phase II/IVA Statement of Work (SOW), if they are found to be needed.

The Phase I investigation revealed that the potential contamination of groundwater by POL products and/or hazardous wastes is due either to spills, leakage, or dumping. Because the exact locations of the above sites are not known, further investigation should initially consist of an appropriate geophysical technique to detect the probable locations of subsurface hydrocarbons, organics, solvents, or buried drums. The geophysical surveys should be performed at the following potentially contaminated sites:

- Site No. 1 - Abandoned Temporary Storage Area
- Site No. 7 - Old Fire Range Area
- Site No. 8 - Burial Site Northeast of Building 202

Areas identified during the geophysical survey as probable locations of hazardous material contamination, should be further investigated by installation of monitoring wells and analyses of soil and water samples.

GLOSSARY OF TERMS

AQUIFER - A geologic formation, or group of formations, that contains sufficient saturated permeable material to conduct groundwater and to yield economically significant quantities of groundwater to wells and springs.

CONTAMINANT - As defined by Section 101(f)(33) of Superfund Amendments and Reauthorization Act of 1986 (SARA) shall include, but not be limited to any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction), or physical deformation in such organisms or their offspring; except that the term "contaminant" shall not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under

(a) any substance designated pursuant to Section 311(b)(2)(A) of the Federal Water Pollution Control Act,

(b) any element, compound, mixture, solution, or substance designated pursuant to Section 102 of this Act,

(c) any hazardous waste having the characteristics identified under or listed pursuant to Section 3001 of the Solid Waste Disposal Act (but not including any waste the regulation of which under the Solid Waste Disposal Act has been suspended by Act of Congress),

(d) any toxic pollutant listed under Section 307(a) of the Federal Water Pollution Control Act,

(e) any hazardous air pollutant listed under Section 112 of the Clean Air Act, and

(f) any imminently hazardous chemical substance or mixture with respect to which the administrator has taken action pursuant to Section 7 of the Toxic Substance Control Act;

and shall not include natural gas, liquefied natural gas, or synthetic gas of pipeline quality (or mixtures of natural gas and such synthetic gas).

CRITICAL HABITAT - The native environment of an animal or plant which, due either to the uniqueness of the organism or the sensitivity of the environment, is susceptible to adverse reactions in response to environmental changes such as may be induced by chemical contaminants.

DOWNGRADIENT - A direction that is hydraulically downslope, i.e., the direction in which groundwater flows.

ENDANGERED SPECIES - Wildlife species that are designated as endangered by the U.S. Fish and Wildlife Service.

GROUNDWATER - refers to the subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

HARM - Hazard Assessment Rating Methodology - A system adopted and used by the United States Air Force to develop and maintain a priority listing of potentially contaminated sites on installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts. (Reference: DEQPPM 81-5, 11 December 1981.

HAS - Hazard Assessment Score - The score developed by utilizing the Hazardous Assessment Rating Methodology (HARM).

HAZARDOUS MATERIAL - Any substance or mixture of substances having properties capable of producing adverse effects on the health and safety of the human being. Specific regulatory definitions also found in OSHA and DOT rules.

HAZARDOUS WASTE - A solid or liquid waste that, because of its quantity, concentration, or physical, chemical, or infectious characteristics may

a. cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or

b. pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

HYDRAULIC CONDUCTIVITY - The rate of flow of water in gallon per day through a cross section of one square foot under a unit hydraulic gradient, at the prevailing temperature (gpd/ft^2). In the SI system, the units are $m^3/day/m^2$ or m/day.

HYDRAULIC GRADIENT - The rate of change in total head per unit of distance of flow in a given direction.

MIGRATION (Contaminant) - The movement of contaminants through pathways (groundwater, surface water, soil, and air).

PERMEABILITY - The capacity of a porous rock, sediment, or soil for transmitting a fluid without impairment of the structure of the medium; it is a measure of the relative ease of fluid flow under unequal pressure.

POROSITY - The percentage of the bulk volume of a rock or soil that is occupied by interstices, whether isolated or connected.

SURFACE WATER - All water exposed at the ground surface, including streams, rivers, ponds, and lakes.

THREATENED SPECIES - Wildlife species who are designated as "Threatened" by the U.S. Fish and Wildlife Service.

TOPOGRAPHY - The general conformation of a land surface, including its relief and the position of its natural and manmade features.

WATER TABLE - The upper limit of the portion of the ground wholly saturated with water.

WETLANDS - An area subject to permanent or prolonged inundation or saturation that exhibits plant communities adapted to this environment.

WILDERNESS AREA - An area unaffected by anthropogenic activities and deemed worthy of special attention to maintain its natural condition.

BILIOGRAPHY

1. Spivey, Jr., L., Soil Survey of Jefferson County, Alabama, United States Department of Agriculture, Soil Conservation Service, 1980.

2. Jones, Walter, B., Special Report #16 Waters of Northern Alabama, 229 pp., 1933.

3. Moffett, T.B., and Moser P.H., Ground-water Resources of the Birmingham and Cahaba Valleys, Jefferson County, Alabama, Geologic Survey of Alabama, Circular No. 103, 1978.

4. Butts, C. "Geologic Atlas of the United States - Birmingham Folio Alabama," United States Geologic Survey Folio No. 175, 1910.

5. Federal Register (47 FR 31224), 16 July 1982.

6. Federal Register (47 FR 31235), 16 July 1982.

Appendix A
Resumes of Search Team Members

JODY C. MOONEY

EDUCATION

B.S., chemistry, University of Maryland, 1975

EXPERIENCE

Eleven years of experience in hazardous waste and environmental science fields. Experience includes research in organic chemistry (polythiol-ene) and management for a treatment/storage/disposal (TSD) facility. As an associate chemist, performed analysis of inorganic and organic parameters of wastewater samples. Has extensive knowledge of state and federal DOT, RCRA and TSCA regulations on hazardous waste.

EMPLOYMENT

Dynamac Corporation (1986-present): Staff Scientist

Responsibilities include site surveys and records searches for the Phase I portion of the Installation Restoration Program for the Air National Guard. Efforts include risk assessment, site prioritization and remedial action recommendations. Participated in the evaluation of a wastewater treatment plant.

Transviron Incorporated (1984-1985): Environmental Scientist

Prepared proposals for various remedial investigations and feasibility studies (including NUS subcontract award) and supervised field activities relating to investigations and cleanups. Also responsible for hazardous waste management programs set up for commercial clients.

Atlantic Coast Environmental, Inc. (1983-1984): Director of Chemical Services

Planned, directed, and controlled the activities of two operation managers and one technical supervisor for a TSD facility. Supervised facility laboratory operation and assisted clients in chemical disposal problems. Chemical advisor to emergency coordinator of chemical spills.

Browning-Ferris Industries, Inc. (1982-1983): Chemist

Responsible for assuring that the facility (Quarantine Road) operated in compliance with state, local, and federal regulations. Managed the East Coast Regional Environmental Laboratory. Developed field procedures for groundwater monitoring program. Responsible for sampling analysis, treatment, and bringing six lagoons into compliance for discharge with NPDES permit.

Hittman Associates, Inc. (1980-1982): Associate Chemist

Performed analysis of inorganic and organic parameters of wastewater samples. Organized supplies and sample shipment for Exxon Donor Solvent Program. As project scientist, conducted a wastewater study at Bush River, Maryland. Laboratory representative on the safety committee.

Alcolac, Inc. (1979-1980): Quality Control Laboratory Technician

W.R. Grace, Inc., Washington Research Center (1975-1978): Research Technician (Organic)

PROFESSIONAL AFFILIATIONS

The American Society for Testing and Materials -- D-34 Committee on Waste Disposal
The American Chemical Society -- Maryland Local Section

BRADLEY A. HILTON

EDUCATION

B.S., civil engineering, Pennsylvania State University, 1972

CERTIFICATION

Engineer-in-Training - Pennsylvania, 1972

EXPERIENCE

Fourteen years' experience in the environmental and civil engineering fields. Responsible for the management and administration of large, complex projects related to environmental engineering and public works in the areas of hazardous waste site identification and remedial action, solid waste disposal, water and wastewater purification and treatment, and highway construction. Experience includes supervision of projects with overall responsibility for all phases of projects, from preliminary planning through design, permitting and actual construction, and participation in litigation and contract disputes (arbitration).

EMPLOYMENT

Dynamac Corporation (1986-present): Program Manager

As a program manager with the Remedial Action and Treatment Department of the Hazardous Materials Technical Center (HMTC), supervises and provides engineering management and technical guidance to professional support staff. Investigates and identifies potential hazardous waste disposal sites through onsite records searches and by conducting interviews. Rates potential hazardous waste sites utilizing the Air Force Installation Restoration Program Hazardous Assessment Rating Method (HARM) and EPA's Hazard Ranking System (HRS). Develops a statement of work for use by the client to contract for confirmation and quantification of hazardous waste sites and development of remedial action plans, and assists the client in the administration of these contracts.

Montgomery County, Maryland (1979-1986): Capital Project Coordinator

As the project manager for the development and implementation of Montgomery County's Solid Waste Disposal Program, explained the details of various solid waste disposal projects to the County Executive, County Council, senior County management, and the general public and news media; and reviewed, evaluated, and investigated concerns raised in order to resolve these concerns or justify the lack of need for concern. Established lines of communication with federal, state, regional, and local regulatory agencies, and acted as liaison with these agencies to obtain and/or defend required permits. Developed office operating budgets and CIP project descriptions, justifications, and cost estimates. Provided support to the County Attorney during

preparation for legal proceedings associated with citizen suits, contract disputes or other issues related to solid waste disposal projects, and testified on behalf of the County Government during litigation on these issues when requested or subpoenaed.

Supervised and provided engineering management and technical support in the environmental discipline and areas of contract interpretation to staff of seven professionals assigned to the $45 million short-term solid waste disposal program consisting of the planning, design and construction of a 2,000-ton/day solid waste transfer station; the design and construction of a 6-million-cubic-yard municipal solid waste sanitary landfill; the design and construction of a new road; and the planning, design, and construction of safety improvements to two existing roads. Responsibilities included the actual preparation, development, and negotiation of complex professional services contracts, construction and operating contracts, and change orders; and the supervision and approval of routine contracts and change orders developed and negotiated by project staff. Duties also included the scheduling, coordination and administration of the professional services contracts, construction contracts, and long-term operating contracts comprising the solid waste disposal program; as well as the authorization of payment requisitions and the acceptance of work performed in accordance with these contracts.

Acted as the technical director for a solid waste planning study reevaluating viable long-term solid waste disposal technologies, especially energy recovery type facilities (mass burn and RDF). Served on an interjurisdictional committee developing and awarding regional construction/operating contracts; implemented a 75,000-cubic-yard leaf composting operation; and provided County oversight of the daily operation of a regional sewerage sludge composting facility.

Fairfax County, Virginia (1975-1979): Design/Construction Coordinator

Provided liaison between the Department of Public Works and a consultant construction manager for more than $120 million of work in the overall expansion and upgrading of the County's wastewater treatment facilities to include a 36-MGD secondary and advanced treatment facility employing activated sludge; sludge incineration; flow equalization, phosphorus removal by lime precipitation, recarbonation, and recalcination, suspended solids removal by gravity filtration; organics removal by carbon adsorption; nitrogen removal by breakpoint chlorination; oxygenation; dechlorination, railroad facilities for chemical transportation and off-loading; and standby power generation and four major wastewater conveyance systems with five pump stations (6- to 50-MGD capacity), force mains and gravity sewers including approximately 4,000 feet of tunnels and an inverted syphon. Responsibilities included the overall supervision of the EPA Construction Grant Program; the preparation and updating of the Capital budgets; the preparation, negotiation, and administration of design and construction contracts; the detailed review of all facets of the design/construction activities; and meeting with regulatory agencies, concerned citizens, and the general public to explain the projects.

Washington Suburban Sanitary Commission (1972-1975): Project Manager

Supervised and coordinated the total project design efforts of the design engineers and other consultants for the upgrading and expansion of the Potomac River Water Filtration Plant and the Patuxent Water Filtration Plant. Project managerial duties included the preparation and administration of engineering contracts; the development of design and environmental assessment scopes of work; the coordination and approval of project designs, specifications, bid documents, and shop drawings; and the presentation of project designs to governmental agencies, environmental organizations, and all other concerned citizens.

Pennsylvania Department of Transportation (summers 1970-1972): Civil Engineer Trainee

Duties included assisting the resident engineer in the inspection of all phases of highway and bridge construction including the placing of bridge decks and roadway pavements.

Washington Suburban Sanitary Commission (summer 1969): Engineering Aide

As an engineering aide in the Capital Improvement Planning (CIP) Office, provided preliminary research to determine location, year required, and size and cost of future water and sewer line projects.

Appendix B
Interviewee Information

ALABAMA AIR NATIONAL GUARD
BIRMINGHAM MUNICIPAL AIRPORT
BIRMINGHAM ALABAMA

INTERVIEWEE INFORMATION

Interviewee Number	Primary Duty Assignment	Years Associated with Alabama ANG
1	Pneudraulics Shop	15
2	Environmental Systems	6
3	NDI-Laboratory	16
4	Repair Reclamation	6
5	Sensor Shop	12
6	Engine Shop	25
7	INS Shop	15
8	AGE Shop	14
9	Corrosion Control	6
10	*Corrosion Control*	16
11	Corrosion	2
12	Administration	33
13	Environmental Division	--
14	Motor Pool	26
15	Motor Pool	16
16	POL Fuels Management	36
17	Aircraft Field Maintenance	30
18	Aircraft Field Maintenance	15
19	Fire Department	8
20	Plant Maintenance	32
21	Reconnaissance Technical Squadron	31
22	Photographic Processing Interpretation Facility	20

Appendix C
Outside Agency Contact List

OUTSIDE AGENCY CONTACT LIST

1. Department of the Army
   United States Army Engineers District, Mobile
   P.O. Box 2288
   Mobile, Alabama 36628-0001
   205-694-3781

2. Federal Emergency Management Agency
   Flood Map Distribution Center
   6930 (A-F) San Tomas Road
   Baltimore, Maryland 21227-6227
   800-492-6605

3. Geological Survey of Alabama
   420 Hackberry Lane
   P.O. Box 0
   Tuscaloosa, Alabama 35486
   205-349-2852

4. United States Department of the Interior
   Fish and Wildlife Service
   Jackson Mall Office Center
   300 Woodrow Wilson Avenue
   Suite 316
   Jackson, Mississippi 39213
   601-965-4900

5. Water Works and Sewer Board of the City of Birmingham
   3600 First Avenue, North
   P.O. Box C-110
   Birmingham, Alabama 35283-0110
   205-251-3261

Appendix D
USAF Hazard Assessment Rating Methodology

USAF HAZARD ASSESSMENT RATING METHODOLOGY

The Department of Defense (DoD) has established a comprehensive program to identify, evaluate, and control problems associated with past disposal practices at DoD facilities. One of the actions required under this program is to:

> develop and maintain a priority listing of contaminated installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts. (Reference: DEQPPM 81-5, 11 December 1981).

Accordingly, the United States Air Force (USAF) has sought to establish a system to set priorities for taking further actions at sites based upon information gathered during the Records Search phase of its Installation Restoration Program (IRP).

PURPOSE

The purpose of the site rating model is to provide a relative ranking of sites of suspected contamination from hazardous substances. This model will assist the Air National Guard in setting priorities for follow-on site investigations.

This rating system is used only after it has been determined that (1) potential for contamination exists (hazardous wastes present in sufficient quantity), and (2) potential for migration exists. A site can be deleted from consideration for rating on either basis.

DESCRIPTION OF MODEL

Like the other hazardous waste site ranking models, the U.S. Air Force's site rating model uses a scoring system to rank sites for priority attention. However, in developing this model, the designers incorporated some special features to meet specific DoD program needs.

The model uses data readily obtained during the Records Search portion (Phase I) of the IRP. Scoring judgment and computations are easily made. In assessing the hazards at a given site, the model develops a score based on the most likely routes of contamination and the worst hazards at the site. Sites are given low scores only if there are clearly no hazards. This approach meshes well with the policy for evaluating and setting restrictions on excess DoD properties.

Site scores are developed using the appropriate ranking factors according to the method presented in the flow chart (Figure 1A of this report). The site rating form and the rating factor guideline are provided at the end of this appendix.

As with the previous model, this model considers four aspects of the hazard posed by a specific site: possible receptors of the contamination, the waste and its characteristics, the potential pathways for contamination migration, and any efforts that were made to contain the wastes resulting from a spill.

The receptors category rating is based on four rating factors: the potential for human exposure to the site, the potential for human ingestion of contaminants should underlying aquifers be polluted, the current and anticipated uses of the surrounding area, and the potential for adverse effects upon important biological resources and fragile natural settings. The potential for human exposure is evaluated on the basis of the total population within 1,000 feet of the site, and the distance between the site and the base boundary. The potential for human ingestion of contaminants is based on the distance between the site and the nearest well, the groundwater use of the uppermost aquifer, and population served by the groundwater supply within 3 miles of the site. The uses of the surrounding area are determined by the zoning within a 1-mile radius. Determination of whether or not critical environments exist within a 1-mile radius of the site predicts the potential for

adverse effects from the site upon important biological resources and fragile natural settings. Each rating factor is numerically evaluated (0-3) and increased by a multiplier. The maximum possible score is also computed. The factor score and maximum possible scores are totaled, and the receptors subscore computed as follows: receptors subscore = (100 x factor score subtotal/ maximum score subtotal).

The waste characteristics category is scored in three steps. First, a point rating is assigned based on an assessment of the waste quantity and the hazard (worst case) associated with the site. The level of confidence in the information is also factored into the assessment. Next, the score is multiplied by a waste persistence factor, which acts to reduce the score if the waste is not very persistent. Finally, the score is further modified by the physical state of the waste. Liquid wastes receive the maximum score, while scores for sludges and solids are reduced.

The pathways category rating is based on evidence of contaminant migration or an evaluation of the highest potential (worst case) for contaminant migration along one of three pathways: surface-water migration, flooding, and groundwater migration. If evidence of contaminant migration exists, the category is given a subscore of 80 to 100 points. For indirect evidence, 80 points are assigned, and for direct evidence, 100 points are assigned. If no evidence is found, the highest score among the three possible routes is used. The three pathways are evaluated and the highest score among all four of the potential scores is used.

The scores for each of the three categories are added together and normalized to a maximum possible score of 100. Then the waste management practice category is scored. Scores for sites with no containment are not reduced. Scores for sites with limited containment can be reduced by 5 percent. If a site is contained and well managed, its score can be reduced by 90 percent. The final site score is calculated by applying the waste management practices category factory to the sum of the scores for the other three categories.

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE _____

LOCATION _____

DATE OF OPERATION OR OCCURRENCE _____

OWNER/OPERATOR _____

COMMENTS/DESCRIPTION _____

SITE RATED BY _____

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site		4		
B. Distance to nearest well		10		
C. Land use/zoning within 1 mile radius		3		
D. Distance to installation boundary		6		
E. Critical environments within 1 mile radius of site		10		
F. Water quality of nearest surface water body		6		
G. Ground water use of uppermost aquifer		9		
H. Population served by surface water supply within 3 miles downstream of site		6		
I. Population served by ground-water supply within 3 miles of site		6		
		Subtotals	_____	_____

Receptors subscore (100 X factor score subtotal/maximum score subtotal) _____

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) _____
2. Confidence level (C - confirmed, S - suspected) _____
3. Hazard rating (H - high, M - medium, L - low) _____

Factor Subscore A (from 20 to 100 based on factor score matrix) _____

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

_____ X _____ = _____

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

_____ X _____ = _____

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore _____

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water		8		
Net precipitation		6		
Surface erosion		8		
Surface permeability		6		
Rainfall intensity		8		
		Subtotals	_____	_____

Subscore (100 X factor score subtotal/maximum score subtotal) _____

2. Flooding

		1		

Subscore (100 X factor score/3) _____

3. Ground water migration

Depth to ground water		8		
Net precipitation		6		
Soil permeability		8		
Subsurface flows		8		
Direct access to ground water		8		
		Subtotals	_____	_____

Subscore (100 X factor score subtotal/maximum score subtotal) _____

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore _____

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors _____
Waste Characteristics _____
Pathways _____

Total _____ divided by 3 = _____
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

_____ X _____ = ☐

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDELINES

1. RECEPTORS CATEGORY

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
A. Population within 1,000 feet (includes on-base facilities)	0	1-25	26-100	Greater than 100	4
B. Distance to nearest water well	Greater than 3 miles	1 to 3 miles	3,001 feet to 1 mile	0 to 3,000 feet	10
C. Land Use/Zoning (within 1-mile radius)	Completely remote (zoning not applicable)	Agricultural	Commercial or Industrial	Residential	3
D. Distance to installation boundary	Greater than 2 miles	1 to 2 miles	1,001 feet to 1 mile	0 to 1,000 feet	6
E. Critical environments (within 1-mile radius)	Not a critical environment	Natural areas	Pristine natural areas; minor wetlands; preserved areas; presence of economically important natural resources susceptible to contamination	Major habitat of an endangered or threatened species; presence of recharge area; major wetlands	10
F. Water quality/use designation of nearest surface water body	Agricultural or Industrial use	Recreation, propagation and management of fish and wildlife	Shellfish propagation and harvesting	Potable water supplies	6
G. Ground-water use of uppermost aquifer	Not used, other sources readily available	Commercial, Industrial, or irrigation, very limited other water sources	Drinking water, municipal water available	Drinking water, no municipal water available; commercial, industrial, or irrigation, no other water source available	9
H. Population served by surface water supplies within 3 miles downstream of site	0	1-15	51-1,000	Greater than 1,000	6
I. Population served by aquifer supplies within 3 miles of site	0	1-50	51-1,000	Greater than 1,000	6

II. WASTE CHARACTERISTICS

A-1 Hazardous Waste Quantity

S = Small quantity (5 tons or 20 drums of liquid)
M = Moderate quantity (5 to 20 tons or 21 to 85 drums of liquid)
L = Large quantity (?0 tons or 85 drums of liquid)

A-2 Confidence Level of Information

C = Confirmed confidence level (minimum criteria below)

- o Verbal reports from interviewer (at least 2) or written information from the records
- o Knowledge of types and quantities of wastes generated by shops and other areas on base

S = Suspected confidence level

- o No verbal reports or conflicting verbal reports and no written information from the records
- o Logic based on a knowledge of the types and quantities of hazardous wastes generated at the base, and a history of past waste disposal practices indicate that these wastes were disposed of at a site

A-3 Hazard Rating

Rating Factors	Rating Scale Levels			
	0	1	2	3
Toxicity	Sax's Level 0	Sax's Level 1	Sax's Level 2	Sax's Level 3
Ignitability	Flash point greater than ?00°F	Flash point at 140°F to ?00°F	Flash point at 80°F to 140°F	Flash point less than 80°F
Radioactivity	At or below background levels	1 to 3 times background levels	3 to 5 times background levels	Over 5 times background levels

Use the highest individual rating based on toxicity, ignitability and radioactivity and determine the hazard rating.

Hazard Rating	Points
High (H)	3
Medium (M)	2
Low (L)	1

II. WASTE CHARACTERISTICS--Continued

Waste Characteristics Matrix

Point Rating	Hazardous Waste Quantity	Confidence Level of Information	Hazard Rating
100	L	C	H
80	L	C	M
	M	C	H
70	L	S	H
60	S	C	H
	M	C	M
	L	S	M
50	L	C	L
	M	S	H
	S	C	M
	S	S	H
40	M	S	M
	M	C	L
	L	S	L
	S	C	L
30	M	S	L
	S	S	M
20	S	S	L

Notes:
For a site with more than one hazardous waste, the waste quantities may be added using the following rules:

Confidence Level

- o Confirmed confidence levels (C) can be added.
- o Suspected confidence levels (S) can be added.
- o Confirmed confidence levels cannot be added with suspected confidence levels.

Waste Hazard Rating

- o Wastes with the same hazard rating can be added.
- o Wastes with different hazard ratings can only be added in a downgrade mode, e.g., MCM + SCH = LCM if the total quantity is greater than 20 tons.

Example: Several wastes may be present at a site, each having an MCM designation (60 points). By adding the quantities of [illegible] waste, the designation may change to LCM (80 point[illegible] in this case, the correct point rating for the waste is 80.

B. Persistence Multiplier for Point Rating

Multiply Point Rating Persistence Criteria	From Part A by the Following
Metals, polycyclic compounds, and halogenated hydrocarbons	1.0
Substituted and other ring compounds	0.9
Straight chain hydrocarbons	0.8
Easily biodegradable compounds	0.4

C. Physical State Multiplier

Physical State	Multiply Point Total From Parts A and B by the Following
Liquid	1.0
Sludge	0.75
Solid	0.50

III. PATHWAYS CATEGORY

A. Evidence of Contamination

Direct evidence is obtained from laboratory analyses of hazardous contaminants present above natural background levels in surface water, ground water, or air. Evidence should confirm that the source of contamination is the site being evaluated.

Indirect evidence might be from visual observation (i.e., leachate), vegetation stress, sludge deposits, presence of taste and odors in drinking water, or reported discharges that cannot be directly confirmed as resulting from the site, but the site is greatly suspected of being a source of contamination.

B-1 Potential for Surface Water Contamination

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
Distance to nearest surface water (includes drainage ditches and storm sewers)	Greater than 1 mile	2,001 feet to 1 mile	501 feet to 2,000 feet	0 to 500 feet	8
Net precipitation	less than -10 inches	-10 to +5 inches	+5 to +20 inches	Greater than +20 inches	6
Surface erosion	None	Slight	Moderate	Severe	8
Surface permeability	0% to 15% clay ($>10^{-2}$ cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	Greater than 50% clay ($>10^{-6}$ cm/sec)	6
Rainfall intensity based on 1-year 24-hour rainfall (Thunderstorms)	<1.0 inch 0-5 0	1.0 to 2.0 inches 6-35 30	2.1 to 3.0 inches 36-49 60	>3.0 inches >50 100	8

B-2 Potential for Flooding

Floodplain	Beyond 100-year floodplain	In 100-year floodplain	In 10-year floodplain	Floods annually	1

B-3 Potential for Ground-Water Contamination

Depth to ground water	Greater than 500 feet	50 to 500 feet	11 to 50 feet	0 to 10 feet	8
Net precipitation	less than -10 inches	-10 to +5 inches	+5 to + 20 inches	Greater than +20 inches	6
Soil permeability	Greater than 50% clay ($>10^{-6}$ cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	0% to 15% clay ($<10^{-2}$ cm/sec)	8

B-3 Potential for Ground-Water Contamination--Continued

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
Subsurface flows	Bottom of site greater than 5 feet above high ground-water level	Bottom of site occasionally submerged	Bottom of site frequently submerged	Bottom of site located below mean ground-water level	8
Direct access to ground water (through faults, fractures, faulty well casings, subsidence, fissures, etc.)	No evidence of risk	Low risk	Moderate risk	High risk	8

IV. WASTE MANAGEMENT PRACTICES CATEGORY

A. This category adjusts the total risk as determined from the receptors, pathways, and waste characteristics categories for waste management practices and engineering controls designed to reduce this risk. The total risk is determined by first averaging the receptors, pathways, and waste characteristics subscores.

B. Waste Management Practices Factor

The following multipliers are then applied to the total risk points (from A):

Waste Management Practice	Multiplier
No containment	1.0
Limited containment	0.95
Fully contained and in full compliance	0.10

Guidelines for fully contained:

Landfills:

- o Clay cap or other impermeable cover
- o Leachate collection system
- o Liners in good condition
- o Adequate monitoring wells

Surface Impoundments:

- o Liners in good condition
- o Sound dikes and adequate freeboard
- o Adequate monitoring wells

Spills:

- o Quick spill cleanup action taken
- o Contaminated soil removed
- o Soil and/or water samples confirm total cleanup of the spill

Fire Protection Training Areas:

- o Concrete surface and berms
- o Oil/water separator for pretreatment of runoff
- o Effluent from oil/water separator to treatment plant

General Note: If data are not available or known to be complete the factor ratings under items I-A through I, III-B-1, or III-6-3, then leave blank for calculation of factor score and maximum possible score.

CNR122

Appendix E
Site Hazardous Assessment Rating Forms

HEADQUARTERS, 117th TACTICAL RECONNAISSANCE WING
ALABAMA AIR NATIONAL GUARD
BIRMINGHAM MUNICPAL AIRPORT
BIRMINGHAM, ALABAMA

USAF Hazard Assessment Rating Methodology
Factor Rating Criteria

1. RECEPTORS

Population within 1,000 feet of site:	
Site No. 1	Approximately 75 (Middle of Base.
Site Nos. 7 and 8	More than 100 - Residential Development adjacent to site boundary.
Distance to nearest well:	More than 3 miles.
Land use/zoning within 1 mile radius:	Residential.
Distance to installation boundary:	
Site No. 1	Less than 200 feet.
Site No. 7	Approximately 250 feet.
Site No. 8	Approximately 500 feet.
Critical environments within 1 mile:	None.
Water quality of nearest surface water body:	Industrial/none.
Groundwater use of uppermost aquifers:	Not used.
Population served by surface water supply within 3 miles downstream of site:	Surface water supply source 20 miles away from the Base.
Population served by groundwater supply within 3 miles of site:	None known.

HEADQUARTERS, 117th TACTICAL RECONNAISSANCE WING
ALABAMA AIR NATIONAL GUARD
BIRMINGHAM MUNICPAL AIRPORT
BIRMINGHAM, ALABAMA

USAF Hazard Assessment Rating Methodology
Factor Rating Criteria (Continued)

2. WASTE CHARACTERISTICS

Quantity

Site No. 1	More than 5,000 gallons.
Site No. 7	Approximately 4,000 gallons.
Site No. 8	Approximately 4,000 gallons.

Confidence Level

Site No. 1	Confirmed.
Site No. 7	Suspected.
Site No. 8	Confirmed.

Hazard Rating

Site No. 1	Medium.
Site No. 7	Medium.
Site No. 8	Medium.

3. PATHWAYS

Surface Water Migration

Distance to nearest surface water:	Storm drain/storm sewer ± 300 feet.
Net precipitation:	+ 11.65 inches

HEADQUARTERS, 117th TACTICAL RECONNAISSANCE WING
ALABAMA AIR NATIONAL GUARD
BIRMINGHAM MUNICPAL AIRPORT
BIRMINGHAM, ALABAMA

USAF Hazard Assessment Rating Methodology
Factor Rating Criteria (Continued)

3. PATHWAYS (Continued)

Surface Water Migration

Surface erosion:	None.
Surface permeability:	1.41×10^{-3} to 4.23×10^{-4} cm/sec.
Rainfall intensity:	3.5 inches.
Flooding:	Within 100 year floodplain.

Groundwater Migration

Depth to groundwater:

Site No. 1	Less than 15 feet.
Site No. 7	Less than 10 feet.
Site No. 8	Less than 10 feet.

Net precipitation:	+ 11.65 inches.
Soil permeability:	1.41×10^{-3} to 4.23×10^{-4} cm/sec.
Subsurface flow:	Less than 5 feet at times.
Direct access to groundwater:	Moderate risk - sink holes in area.

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE: Site No. 1 - Abandoned Temporary Storage Area

LOCATION: Alabama Air National Guard, Birmingham Municipal Airport, Birmingham, Alabama

DATE OF OPERATION OR OCCURRENCE: 1950 to 1968

OWNER/OPERATOR: 117th Tactical Reconnaissance Wing

COMMENTS/DESCRIPTION: Site is adjacent to Building 130

SITE RATED BY: Hazardous Materials Technical Center

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	2	4	8	12
B. Distance to nearest well	0	10	0	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to installation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	0	10	0	30
F. Water quality of nearest surface water body	0	6	0	18
G. Ground water use of uppermost aquifer	0	9	0	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	0	6	0	18
		Subtotals	35	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal): 19

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large): L
2. Confidence level (C = confirmed, S = suspected): C
3. Hazard rating (H = high, M = medium, L = low): M

Factor Subscore A (from 20 to 100 based on factor score matrix): 80

B. Apply persistence factor

Factor Subscore A X Persistence Factor = Subscore B

1.0 X 80 = 80

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

1.0 X 80 = 80

HAZARDOUS ASSESSMENT RATING FORM

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	3	8	24	24
		Subtotals	66	108

Subscore (100 X factor score subtotal/maximum score subtotal) 61

2. Flooding

	1	1	1	3

Subscore (100 X factor score/3) 33

3. Ground water migration

Depth to ground water	2	8	16	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	1	8	8	24
Direct access to ground water	2	8	16	24
		Subtotals	68	114

Subscore (100 X factor score subtotal/maximum score subtotal) 60

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 61

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors 19
Waste Characteristics 80
Pathways 61

Total 160 divided by 3 = 53
Gross Total Sc

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

53 X 0.95 = 51

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE: Site No. 7 - Old Firing Range Area

LOCATION: Alabama Air National Guard, Birmingham Municipal Airport, Birmingham, Alabama

DATE OF OPERATION OR OCCURRENCE: Late 1960's

OWNER/OPERATOR: 117th Tactical Reconnaissance Wing

COMMENTS/DESCRIPTION: One time disposal late 1960's

SITE RATED BY: Hazardous Material Technical Center

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	0	10	0	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to installation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	0	10	0	30
F. Water quality of nearest surface water body	0	6	0	18
G. Ground water use of uppermost aquifer	0	9	0	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	0	6	0	18
		Subtotals	39	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal): 22

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large): M
2. Confidence level (C - confirmed, S - suspected): S
3. Hazard rating (H - high, M - medium, L - low): M

Factor Subscore A (from 20 to 100 based on factor score matrix): 40

B. Apply persistence factor

Factor Subscore A X Persistence Factor = Subscore B

1.0 X 40 = 40

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

1.0 X 40 = 40

HAZARDOUS ASSESSMENT RATING FORM

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore _____

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	3	8	24	24
		Subtotals	66	108

Subscore (100 X factor score subtotal/maximum score subtotal) 61

2. Flooding	1	1	1	3

Subscore (100 X factor score/3) 33

3. Ground water migration

Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	1	8	8	24
Direct access to ground water	2	8	16	24
		Subtotals	76	114

Subscore (100 X factor score subtotal/maximum score subtotal) 67

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 67

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	22
Waste Characteristics	40
Pathways	67
Total 129 divided by 3 =	43

Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

43 X 1.0 = 43

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE Site No. 8 - Burial Site Northeast of Building 202

LOCATION Alabama Air National Guard, Birmingham Municipal Airport, Birmingham, Alabama

DATE OF OPERATION OR OCCURRENCE 1965 - 1970

OWNER/OPERATOR 117th Tactical Reconnaissance Wing

COMMENTS/DESCRIPTION One time use between 1965 - 1970

SITE RATED BY Hazardous Materials Technical Center

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	0	10	0	30
C. Land use/zoning within 1 mile radius	3	1	9	9
D. Distance to installation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	0	10	0	30
F. Water quality of nearest surface water body	0	6	0	18
G. Ground water use of uppermost aquifer	0	9	0	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	0	6	0	18
		Subtotals	39	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 22

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) M
2. Confidence level (C = confirmed, S = suspected) C
3. Hazard rating (H = high, M = medium, L = low) M

Factor Subscore A (from 20 to 100 based on factor score matrix) 60

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

60 X 1.0 = 60

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

60 X 1.0 = 60

HAZARDOUS ASSESSMENT RATING FORM

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.				
			Subscore	
B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.				
1. Surface water migration				
Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	3	8	24	24
		Subtotals	66	108
Subscore (100 X factor score subtotal/maximum score subtotal)				61
2. Flooding	1	1	1	3
Subscore (100 X factor score/3)				33
3. Ground water migration				
Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	1	8	8	24
Direct access to ground water	2	8	16	24
		Subtotals	76	114
Subscore (100 X factor score subtotal/maximum score subtotal)				67
C. Highest pathway subscore.				
Enter the highest subscore value from A, B-1, B-2 or B-3 above.				
			Pathways Subscore	67

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

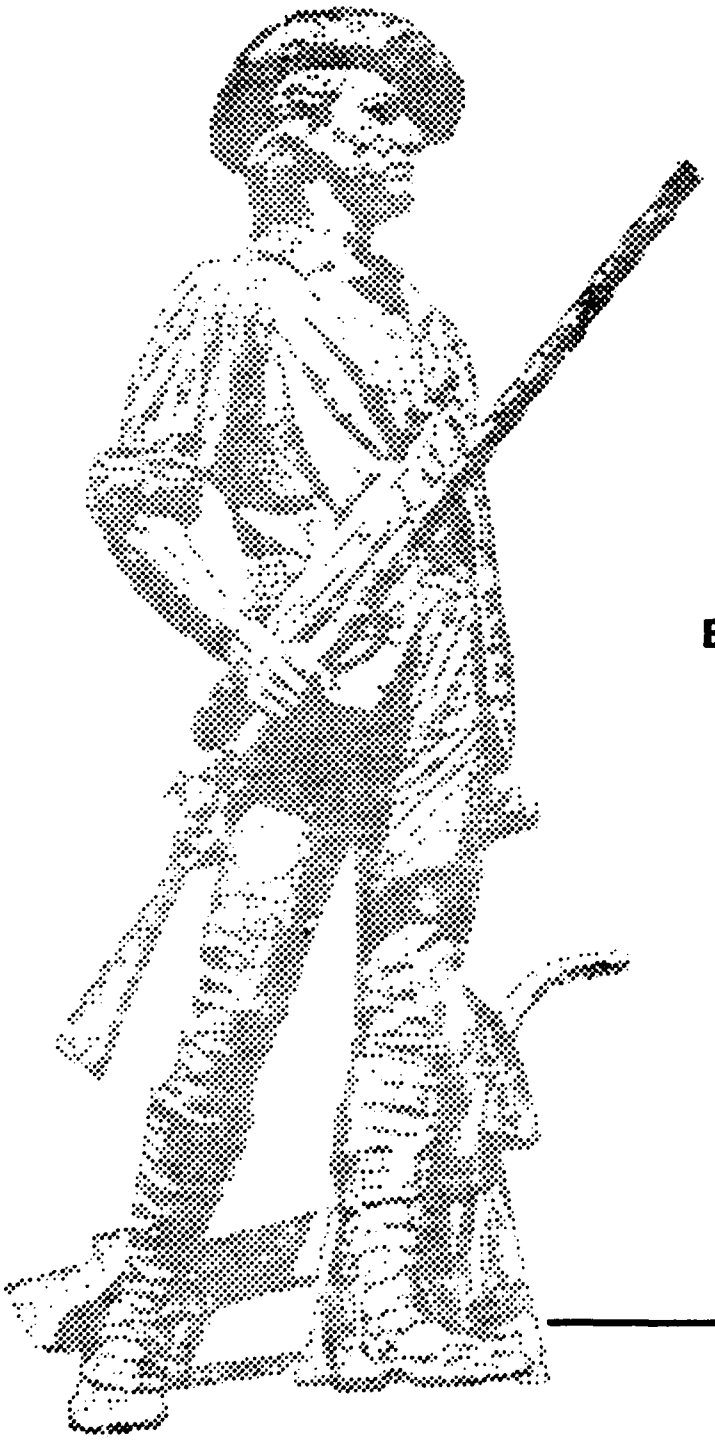
Receptors	22
Waste Characteristics	60
Pathways	67
Total 149 divided by 3 =	50
	Gross Total Sc

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

50 X 1.0 = 50

INSTALLATION RESTORATION PROGRAM

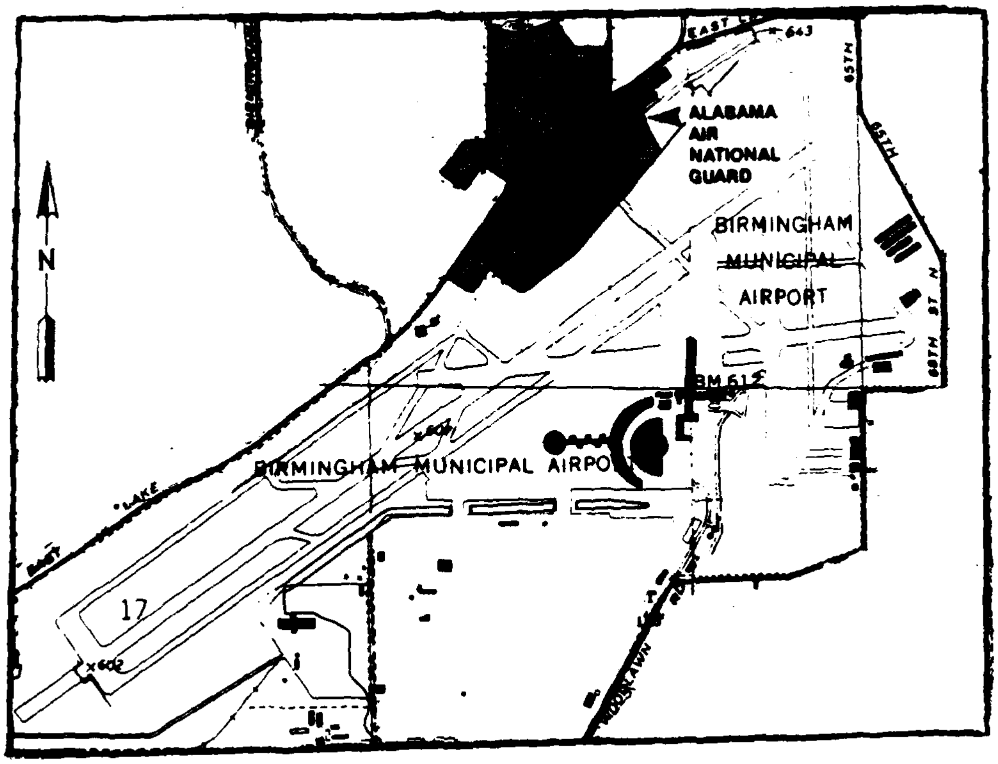


Phase I
Records Search

Part A

Headquarters, 117th Tactical Reconnaissance Wing
Alabama Air National Guard
Birmingham Municipal Airport
Birmingham, Alabama

Hazardous Materials Technical Center
August 1987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INSTALLATION RESTORATION PROGRAM
PHASE I - RECORDS SEARCH FOR

226th COMBAT INFORMATION SYSTEMS GROUP
MARTIN AIR NATIONAL GUARD STATION
GADSDEN MUNICIPAL AIRPORT
GADSDEN, ALABAMA

August 1987

Prepared for

National Guard Bureau
Andrews Air Force Base, Maryland 20331-6008

Prepared by

The Hazardous Materials Technical Center
The Dynamac Building
11140 Rockville Pike
Rockville, Maryland 20852

Contract No. DLA 900-82-C-4426

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EXECUTIVE SUMMARY

A. INTRODUCTION

The Hazardous Materials Technical Center (HMTC) was retained in November 1986 to conduct the Installation Restoration Program (IRP) Phase I - Records Search of the 226th Combat Information Systems Group (CISG), Martin Air National Guard Station, Gadsden Municipal Airport, Gadsden, Alabama, hereinafter referred to as the ANGS, under Contract No. DLA 900-82-C-4426 (Records Search). The Records Search included

- o an onsite visit including interviews with four station employees conducted by HMTC personnel on 6 February 1986;
- o the acquisition and analysis of pertinent information and records on hazardous materials use and hazardous waste generation and disposal at the ANGS;
- o the acquisition and analysis of available geologic, hydrologic, meteorologic, and environmental data from pertinent Federal, State, and local agencies; and
- o the identification of sites on the ANGS which may be potentially contaminated with hazardous materials/hazardous waste.

B. MAJOR FINDINGS

The major operations of the 226th CISG that have used and disposed of hazardous materials/hazardous waste include aerospace ground equipment (AGE) maintenance and ground vehicle maintenance. The operations involve such activities as engine maintenance and combat communication maintenance. Varying quantities of waste oils, PD-680, and sulfuric acid were generated and disposed of by these activities.

Interviews with four station employees and a field survey resulted in the identification of two disposal and/or spill sites at the ANGS. Of the two sites, there are no potentially contaminated sites with hazardous materials/ hazardous waste.

C. CONCLUSIONS

- o Information obtained through interviews with four station personnel, review of ANGS records, and field observations have resulted in the identification of two potential disposal and/or spill sites at the ANGS.

- o Both sites were eliminated from further study because it was concluded that neither of the sites were potentially contaminated with hazardous materials/hazardous waste; therefore, the potential for contaminant migration did not exist, and posed no significant hazards to health and welfare.

D. RECOMMENDATIONS

HMTC does not consider any of the identified sites at the ANGS as susceptible to contaminant migration, or as presenting a risk to human health or the environment. Therefore, there are no recommendations for implementation of the Phase II/IVA program.

I. INTRODUCTION

A. BACKGROUND

The 226th Combat Information Systems Group (CISG) is located at the Martin Air National Guard Station, Gadsden Municipal Airport, Gadsden, Alabama, hereinafter referred to as the ANGS. The ANGS has been active since 1954, and over the years the type of military activities based and serviced there have not varied. Both past and present operations have involved the use of hazardous materials and disposal of hazardous wastes. Because of the use and disposal of hazardous material and disposal of hazardous wastes, the Air National Guard (ANG) has implemented its Installation Restoration Program (IRP). The IRP is a four-phase program consisting of the following:

Phase I - Records Search (Installation Assessment) - identifying past spill or disposal sites posing a potential and/or actual hazard to public health or the environment.

Phase II/IVA - Site Characterization/Remedial Action Plan - acquiring data via field studies, for the confirmation and quantification of environmental contamination that may have an adverse impact on public health or the environment, preparing a Remedial Action Plan (RAP); and, if directed by the National Guard Bureau, preparing designs and specifications.

Phase III - Technology Base Development (if needed) - developing new technology for accomplishment of remediation.

Phase IVB - Implementation of Site Remedial Action.

B. PURPOSE

The purpose of this IRP Phase I - Records Search (hereinafter referred to as Records Search) is to identify and evaluate suspected problems associated with past hazardous waste handling procedures, disposal sites, and spill sites on the ANGS property and to assess the potential for the migration of hazardous

contaminants. HMTC visited the ANGS, reviewed existing environmental information, analyzed ANGS records concerning the use and generation of hazardous materials/hazardous waste, and conducted interviews with past and present personnel of the ANGS who are familiar with past hazardous materials/hazardous waste management activities. Relevant information collected and analyzed as a part of the Records Search included the history of the ANGS, with special emphasis on the history of the shop operations and their past hazardous materials management procedures; the local geological, hydrological, and meteorological conditions that may affect migration of contaminants; local land use, public utilities, and zoning requirements that affect the potentiality for exposure to contaminants, and the ecological settings that indicate environmentally sensitive habitats or evidence of environmental stress.

C. SCOPE

The scope of this Records Search is limited to the ANGS and includes the following:

- o an onsite visit;
- o the acquisition of pertinent information and records on hazardous materials use and hazardous wastes generation and disposal practices at the ANGS;
- o the acquisition of available geologic, hydrologic, meteorologic, land use and zoning, critical habitat, and utility data from various Federal, State and local agencies;
- o a review and analysis of all information obtained; and
- o the preparation of a report, to include recommendations for further actions.

The onsite visit and interviews with past and present personnel were conducted during the period 6 November 1986. The HMTC Records Search Team consisted of the following individuals (Resumes are included as Appendix A):

- o Ms Jody C. Mooney, Environmental Scientist
- o Mr. Bradley Hilton, Program Manager

Individuals from the ANGS who assisted in the Records Search include Mr. Arthur Lee, Environmental Engineer, ANGSC/DEV, and selected members of the 226th CISG. The Point of Contact at the ANGS was Lt. Waylon D. Blakeley, Base Environmental Coordinator.

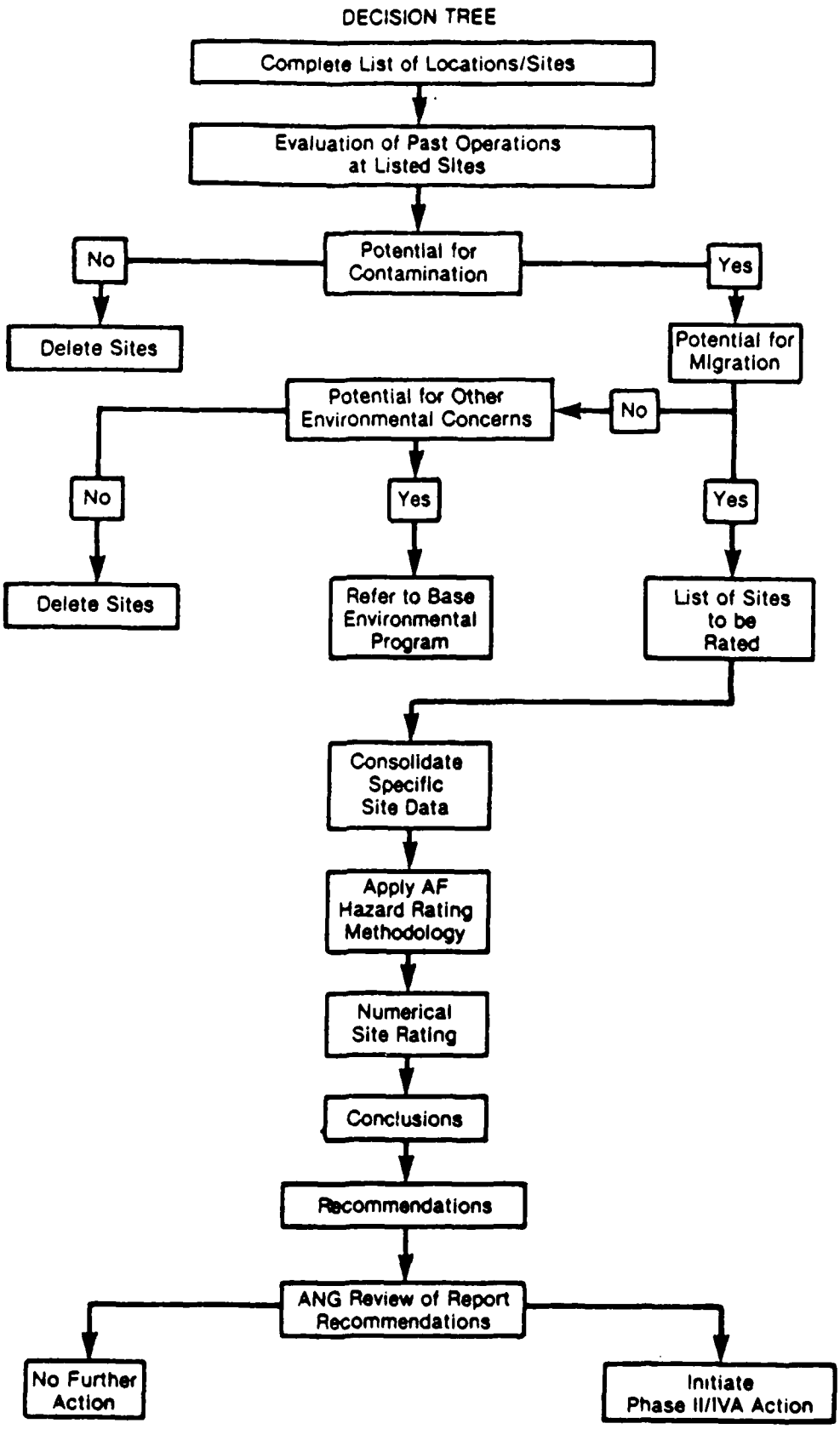
D. METHODOLOGY

A flow chart of the Records Search Methodology is presented in Figure 1B. This Records Search Methodology to the greatest extent possible, ensures a comprehensive collection and review of pertinent site specific information, and is utilized in the identification and assessment of potentially contaminated hazardous waste spill/disposal sites.

The Records Search began with a site visit to the ANGS to identify all shop operations or activities on the station that may have utilized hazardous material or generated hazardous waste. Next, an evaluation of past and present hazardous materials/hazardous waste handling procedures at the identified locations was made to determine whether environmental contamination may have occurred. The evaluation of past hazardous materials handling practices was facilitated by extensive interviews with four past and present employees familiar with the various operating procedures at the station. These interviews were also utilized to define the areas of the ANGS where any waste materials (hazardous or nonhazardous), either intentionally or inadvertently, may have been used, spilled, stored, disposed of, or released into the environment.

Appendix B lists the interviewees' principal areas of knowledge and their years of experience with the ANGS. Historical records contained in the ANGS's files were collected and reviewed to supplement the information obtained from interviews. Using the information outlined above, a list of waste spill/disposal sites on the ANGS were identified for further evaluation. A general survey tour of the identified spill/disposal sites, the ANGS, and the surrounding area was conducted to determine the presence of visible contamination and to help assess the potential for contaminant migration. Particular attention was given to locating nearby drainage ditches, surface water bodies, residences, and wells.

Figure 2B.
Records Search Methodology Flow Chart.



Detailed geological, hydrological, meteorological, developmental (land use and zoning), and environmental data for the area of study was also obtained from appropriate Federal and State agencies as identified in Appendix C. Following a detailed analysis of all the information obtained, it was determined that neither of the two identified sites were potentially contaminated with hazardous materials/hazardous waste, and the potential for contaminant migration did not exist.

II. INSTALLATION DESCRIPTION

A. LOCATION

The 226th CISG is assigned to the Martin Air National Guard Station located adjacent to the Gadsden Municipal Airport in Gadsden, Alabama (see Figure 2B). The figure shows the location and boundaries of the ANGS covered by this Records Search.

B. ORGANIZATION AND HISTORY

The 225th Radio Relay Squadron was formally organized and granted Federal recognition on the 18th of June 1954 during a special organizational meeting held at the Gadsden City Coliseum. This meeting marked the official beginning of the 225th Radio Relay Squadron; however, preparatory work necessary for the activation of this unit had been in process for many months.

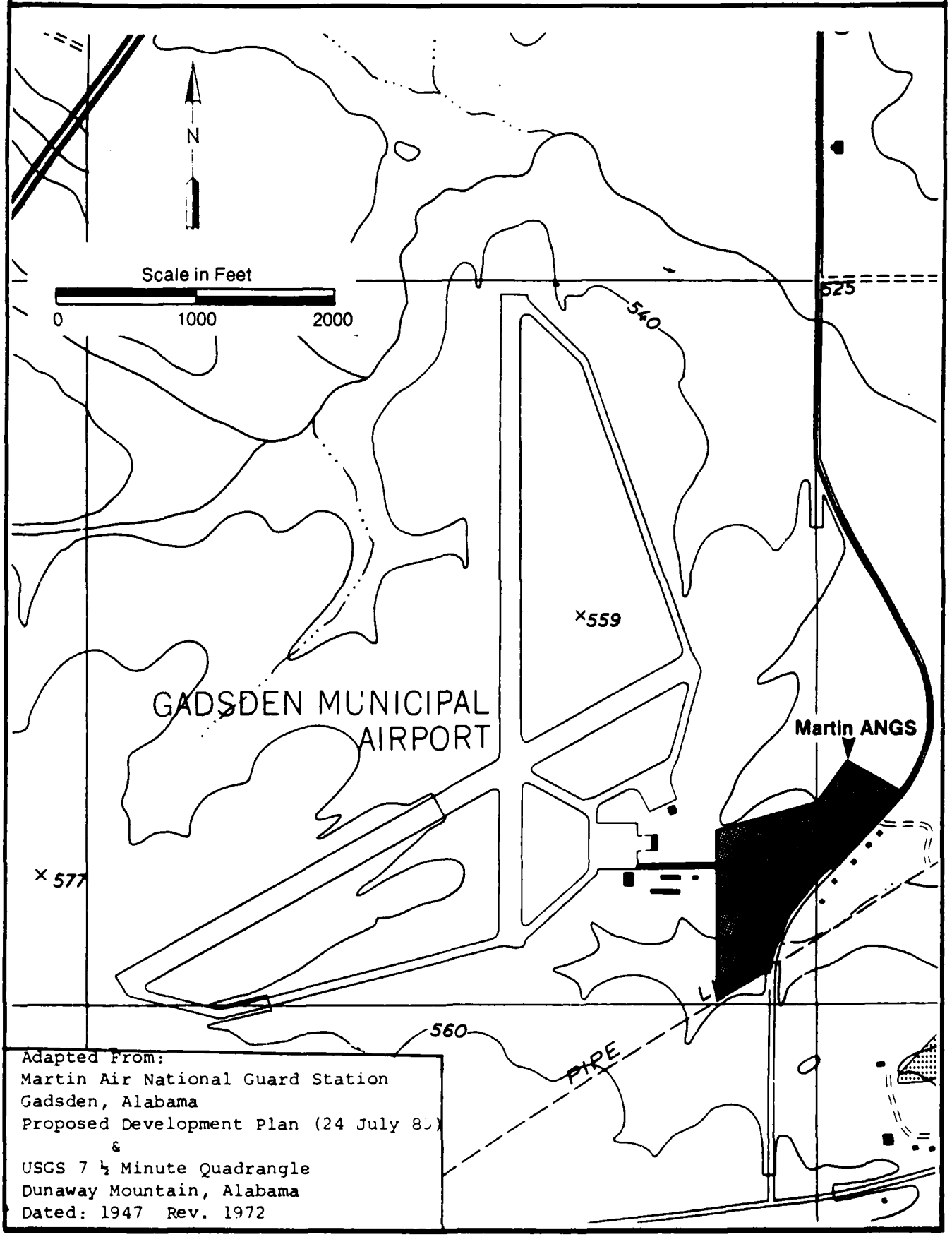
Several months before this meeting of 18 June 1954, Major Samuel G. Norris had learned about the possibility of a Radio Relay Squadron being located in Gadsden with him as commanding officer. Major Norris envisioned what an Air National Guard Unit would mean to the City of Gadsden and the men living in this area and he began work to make this possibility a reality.

Upon activation, the squadron commissioned 4 officers and 95 airmen for an aggregate strength of 99 men. The unit became responsible to the Governor of Alabama through the Adjutant General. Responsibility of logistical support of the squadron was assigned the Base Supply Supervisor and Assistant United States Procurement & Finance Officer, Sumpter Smith Air National Guard Base, currently Alabama ANG, Birmingham Municipal Airport, Birmingham, Alabama.

HMTC

Figure 2B.

Site Map of Martin ANGS, Gadsden Municipal Airport, Gadsden, Alabama



Adapted From:
Martin Air National Guard Station
Gadsden, Alabama
Proposed Development Plan (24 July 85)
&
USGS 7 ½ Minute Quadrangle
Dunaway Mountain, Alabama
Dated: 1947 Rev. 1972

III. ENVIRONMENTAL SETTING

A. METEOROLOGY

Precipitation in Etowah County, Alabama averages 53.65 inches annually, based on the 30-year interval, 1936 to 1958. By calculating net precipitation according to the method outlined in the Federal Register (47 FR 31224, 16 July 1982) a net precipitation value of 11.65 inches per year is obtained. Rainfall intensity, based on 1-year frequency, 24-hour duration rainfall, is 3.5 inches (calculated according to 47 FR, 31235, 16 July 1982, Figure 8).

B. GEOLOGY

The ANGS is located in Etowah County, in northeastern Alabama. The rocks that crop out in Etowah County range from the Rome Formation, of Cambrian Age (600 million years old), to the Pottsville Formation, of Pennsylvanian Age (286 to 320 million years old).

The geologic formation which directly underlies the ANGS is the Conasauga Shale. This Cambrian-aged rock consists of greenish clay-shales with interbedded blue, seamy limestone (Walcott, 1896). Nowhere in the county is the formation sufficiently well exposed to be measured, but from the width of its outcrop in the Coosa Valley its thickness is estimated at more than 1,000 feet.

According to the Soil Survey of Etowah County, Alabama, the soils developed on the Conasauga Shale are yellowish-brown loam about 5 inches thick. The subsoil to a depth of 12 inches, is yellowish-red clay; to a depth of 22 inches, yellowish-red clay with common distinct red and yellowish-brown mottles; and to a depth of 39 inches, mottled yellowish-red, strong brown, red, and yellowish-brown clay. The underlying material is partially weathered, and fractured shaled to a depth of 60 inches.

The soil has low strength and high shrink-swell potential and is slowly permeable, 4.23×10^{-5} to 1.41×10^{-4} cm/sec.

C. HYDROLOGY

1. Surface Water

As determined by the Federal Emergency Management Agency, the ANGS is within the boundaries of a floodplain associated with 100-year frequency floods. Surface waters from the base eventually find their way into Wills Creek via small runs and branches, drainage ditches, and eventually small tributaries.

2. Groundwater

The water table aquifer underlying the ANGS occurs at a depth of less than 20 feet, based on a comparison of the elevation of the headwaters of near-by surface streams to the land surface elevation at the ANGS. The primary porosity of the Conasauga Shale is very low; therefore, this groundwater occurs within secondary fractures.

Because the ANGS occupies a topographic high, the groundwater flow direction will vary, depending on location. The dominant flow direction, however, is probably eastward, toward the Big Wills Creek. Because of the low transmissive properties of the Conasauga Shale, the regional groundwater flow direction is not likely to be significantly affected by drawdown associated with small domestic wells such as are likely to exist near the ANGS.

IV. SITE EVALUATION

A. ACTIVITY REVIEW

A review of base records and interviews with past and present station employees resulted in the identification of specific operations within each activity in which the majority of industrial chemicals are handled and hazardous wastes are generated. Table 1B summarizes the major operations associated with each activity, provides estimates of the quantities of waste currently being generated by these operations, and describes the past and present disposal practices for the wastes. If an operation is not listed in Table 1B, then that operation has been determined on a best-estimate basis to produce negligible (less than five gallons per year) quantities of wastes requiring disposal. For example, extremely small volumes of methyl ethyl ketone commonly evaporate after use, and therefore do not present a disposal problem. Conversely, if a particularly volatile compound is listed, then the quantity represents an estimate of the amount actually disposed of according to the method shown.

B. DISPOSAL/SPILL SITE IDENTIFICATION, EVALUATION, AND HAZARD ASSESSMENT

Interviews with four base personnel (Appendix B) and subsequent site inspections resulted in the identification of two waste disposal/spill sites. It was determined that neither of the sites is potentially contaminated with hazardous materials/hazardous waste with potential for migration. Therefore, they should not be further evaluated or scored using HARM (Appendix D).

Site No. 1 - Current Waste Storage Facility (Unrated)

The current waste storage facility is behind the equipment parking lot area. It consists of an open asphalt lot with no containment structures. Drums were observed being stored in an upright position, with accumulations of precipitation on them. The shop wastes that are stored here include oil, hydraulic fluid, and PD-680. Other than routine drippings and seepage (estimated to be less than five gallons total), no spills have been noted at this

For these reasons, a HAS and further evaluation was deemed unnecessary.

Table 1B. Hazardous Materials/Hazardous Waste Disposal Summary:
Martin ANGS, Gadsden Municipal Airport, Gadsden, Alabama

Shop Name	Building No.	Hazardous Materials/Hazardous Waste	Estimated Quantities (Gal/Year)	Method of Treatment/Storage/Disposal* 1961	1970	1986
Motor Pool		Oil	150	'-FS--'----------DRMO-------'		
		Sulfuric Acid	Unknown	'----------NEUT-------'		
		Hydraulic Fluid	Unknown	----------DRMO-------'		
		PD-680	Unknown	'----------DRMO-------'		

*LEGEND:

FS - Fence Spray

NEUT - Neutralized and drained to sanitary sewer

DRMO - Disposed of by Defense Reutilization and Marketing Office (Prior to 1985 disposal was by the Defense Property Disposal Office - DPDO)

Site No. 2 - Weed Control Around Perimeter Fence (Unrated)

A total of approximately 150 gallons of used motor oils were sprayed around the perimeter fence for weed control. Because of the quantity used and the fact that this occurred 17 years ago, it was decided that this site did not require a HAS or further study.

C. CRITICAL HABITATS/ENDANGERED OR THREATENED SPECIES

Discussions with personnel from the United States Department of the Interior, Fish and Wildlife Service, disclosed that there are no indigenous, endangered, or threatened species of flora or fauna in the vicinity of Martin ANGS. There are no critical habitats, wetlands, or wilderness areas within a radius of one mile from the ANGS.

D. OTHER PERTINENT FACTS

- Sanitary sewage is treated municipally.
- There are no active landfills on ANGS property.
- Waste oils have not been reported to be used for road dust control on the ANGS.
- To date, no environmental monitoring has been conducted at the station.
- Radioactive waste has never been disposed of on ANGS property.
- There have never been any known leaks of PCB-contaminated oils from electrical transformers or capacitors on ANGS property.
- There are no current or past Fire Training Areas (FTA) at the station.
- There has not been extensive use or storage of any pesticides or fertilizers at ANGS.

V. CONCLUSIONS

- Information obtained through interviews with four base personnel, review of station records, and field observations have resulted in the identification of two potential disposal and/or spill sites at the ANGS.

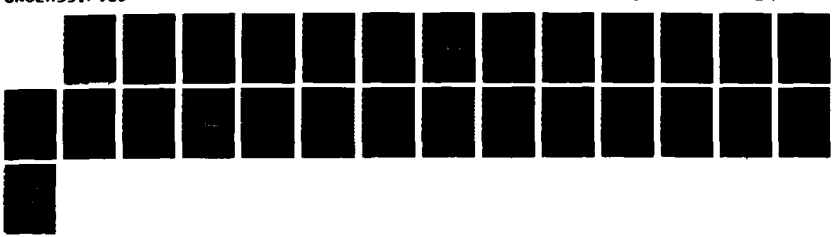
- Both sites were eliminated from further study because it was concluded that they were not contaminted with hazardous materials/hazardous waste and a potential for migration did not exist; therefore, they pose no significant hazards to health and welfare.

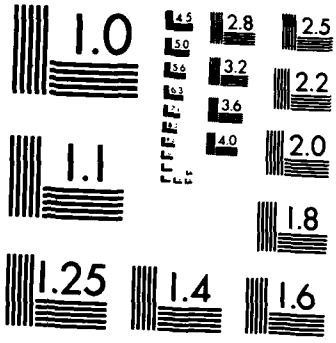
VI. RECOMMENDATIONS

HMTC does not consider either of the identified sites at the ANGS as susceptible to contaminant migration, or as presenting a risk to human health or the environment. Therefore, implementation of the Phase II/IVA program is not required.

AD-A189 838 INSTALLATION RESTORATION PROGRAM PHASE 1 RECORDS SEARCH 2/2
FOR PART A HEADQ (U) HAZARDOUS MATERIALS TECHNICAL
CENTER ROCKVILLE MD AUG 87 DLA900-82-C-4426

UNCLASSIFIED F/G 24/7 NL





GLOSSARY OF TERMS

AQUIFER - A geologic formation, or group of formations, that contains sufficient saturated permeable material to conduct groundwater and to yield economically significant quantities of groundwater to wells and springs.

CONTAMINANT - As defined by Section 101(f)(33) of Superfund Amendments and Reauthorization Act of 1986 (SARA) shall include, but not be limited to any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction), or physical deformation in such organisms or their offspring; except that the term "contaminant" shall not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under

(a) any substance designated pursuant to Section 311(b)(2)(A) of the Federal Water Pollution Control Act,

(b) any element, compound, mixture, solution, or substance designated pursuant to Section 102 of this Act,

(c) any hazardous waste having the characteristics identified under or listed pursuant to Section 3001 of the Solid Waste Disposal Act (but not including any waste the regulation of which under the Solid Waste Disposal Act has been suspended by Act of Congress),

(d) any toxic pollutant listed under Section 307(a) of the Federal Water Pollution Control Act,

(e) any hazardous air pollutant listed under Section 112 of the Clean Air Act, and

(f) any imminently hazardous chemical substance or mixture with respect to which the administrator has taken action pursuant to Section 7 of the Toxic Substance Control Act;

and shall not include natural gas, liquefied natural gas, or synthetic gas of pipeline quality (or mixtures of natural gas and such synthetic gas).

CRITICAL HABITAT - The native environment of an animal or plant which, due either to the uniqueness of the organism or the sensitivity of the environment, is susceptible to adverse reactions in response to environmental changes such as may be induced by chemical contaminants.

DOWNGRADIENT - A direction that is hydraulically downslope, i.e., the direction in which groundwater flows.

ENDANGERED SPECIES - Wildlife species that are designated as endangered by the U.S. Fish and Wildlife Service.

GROUNDWATER - refers to the subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

HARM - Hazard Assessment Rating Methodology - A system adopted and used by the United States Air Force to develop and maintain a priority listing of potentially contaminated sites on installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts. (Reference: DEQPPM 81-5, 11 December 1981.

HAS - Hazard Assessment Score - The score developed by utilizing the Hazardous Assessment Rating Methodology (HARM).

HAZARDOUS MATERIAL - Any substance or mixture of substances having properties capable of producing adverse effects on the health and safety of the human being. Specific regulatory definitions also found in OSHA and DOT rules.

HAZARDOUS WASTE - A solid or liquid waste that, because of its quantity, concentration, or physical, chemical, or infectious characteristics may

a. cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or

b. pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

HYDRAULIC CONDUCTIVITY - The rate of flow of water in gallon per day through a cross section of one square foot under a unit hydraulic gradient, at the prevailing temperature (gpd/ft^2). In the SI system, the units are $m^3/day/m^2$ or m/day.

HYDRAULIC GRADIENT - The rate of change in total head per unit of distance of flow in a given direction.

MIGRATION (Contaminant) - The movement of contaminants through pathways (groundwater, surface water, soil, and air).

PERMEABILITY - The capacity of a porous rock, sediment, or soil for transmitting a fluid without impairment of the structure of the medium; it is a measure of the relative ease of fluid flow under unequal pressure.

POROSITY - The percentage of the bulk volume of a rock or soil that is occupied by interstices, whether isolated or connected.

SURFACE WATER - All water exposed at the ground surface, including streams, rivers, ponds, and lakes.

THREATENED SPECIES - Wildlife species who are designated as "Threatened" by the U.S. Fish and Wildlife Service.

TOPOGRAPHY - The general conformation of a land surface, including its relief and the position of its natural and manmade features.

WATER TABLE - The upper limit of the portion of the ground wholly saturated with water.

WETLANDS - An area subject to permanent or prolonged inundation or saturation that exhibits plant communities adapted to this environment.

WILDERNESS AREA - An area unaffected by anthropogenic activities and deemed worthy of special attention to maintain its natural condition.

BIBLIOGRAPHY

1. Montgomery, Charles F. Neal, Harold B. and Anderson, William V., Soil Survey of Etowah County, Alabama, United States Department of Agriculture Soil Conservation Service, 16 pp., 1976.

2. Jones, Walter B., Special Report #16 Waters of Northern Alabama, 196 pp., 1933.

3. Walcott, C., Geologic Atlas of the United States - Gadsden Folio Alabama, United States Geologic Survey Folio No. 35, 1896.

4. Federal Register (47 FR 31224), 16 July 1982.

5. Federal Register (47 FR 31235), 16 July 1982.

Appendix A
Resumes of Search Team Members

JODY C. MOONEY

EDUCATION

B.S., chemistry, University of Maryland, 1975

EXPERIENCE

Eleven years of experience in hazardous waste and environmental science fields. Experience includes research in organic chemistry (polythiol-ene) and management for a treatment/storage/disposal (TSD) facility. As an associate chemist, performed analysis of inorganic and organic parameters of wastewater samples. Has extensive knowledge of state and federal DOT, RCRA and TSCA regulations on hazardous waste.

EMPLOYMENT

Dynamac Corporation (1986-present): Staff Scientist

Responsibilities include site surveys and records searches for the Phase I portion of the Installation Restoration Program for the Air National Guard. Efforts include risk assessment, site prioritization and remedial action recommendations. Participated in the evaluation of a wastewater treatment plant.

Transviron Incorporated (1984-1985): Environmental Scientist

Prepared proposals for various remedial investigations and feasibility studies (including NUS subcontract award) and supervised field activities relating to investigations and cleanups. Also responsible for hazardous waste management programs set up for commercial clients.

Atlantic Coast Environmental, Inc. (1983-1984): Director of Chemical Services

Planned, directed, and controlled the activities of two operation managers and one technical supervisor for a TSD facility. Supervised facility laboratory operation and assisted clients in chemical disposal problems. Chemical advisor to emergency coordinator of chemical spills.

Browning-Ferris Industries, Inc. (1982-1983): Chemist

Responsible for assuring that the facility (Quarantine Road) operated in compliance with state, local, and federal regulations. Managed the East Coast Regional Environmental Laboratory. Developed field procedures for groundwater monitoring program. Responsible for sampling analysis, treatment, and bringing six lagoons into compliance for discharge with NPDES permit.

Hittman Associates, Inc. (1980-1982): Associate Chemist

Performed analysis of inorganic and organic parameters of wastewater samples. Organized supplies and sample shipment for Exxon Donor Solvent Program. As project scientist, conducted a wastewater study at Bush River, Maryland. Laboratory representative on the safety committee.

Alcolac, Inc. (1979-1980): Quality Control Laboratory Technician

W.R. Grace, Inc., Washington Research Center (1975-1978): Research Technician (Organic)

PROFESSIONAL AFFILIATIONS

The American Society for Testing and Materials -- D-34 Committee on Waste Disposal
The American Chemical Society -- Maryland Local Section

BRADLEY A. HILTON

EDUCATION

B.S., civil engineering, Pennsylvania State University, 1972

CERTIFICATION

Engineer-in-Training - Pennsylvania, 1972

EXPERIENCE

Fourteen years' experience in the environmental and civil engineering fields. Responsible for the management and administration of large, complex projects related to environmental engineering and public works in the areas of hazardous waste site identification and remedial action, solid waste disposal, water and wastewater purification and treatment, and highway construction. Experience includes supervision of projects with overall responsibility for all phases of projects, from preliminary planning through design, permitting and actual construction, and participation in litigation and contract disputes (arbitration).

EMPLOYMENT

Dynamac Corporation (1986-present): Program Manager

As a program manager with the Remedial Action and Treatment Department of the Hazardous Materials Technical Center (HMTC), supervises and provides engineering management and technical guidance to professional support staff. Investigates and identifies potential hazardous waste disposal sites through onsite records searches and by conducting interviews. Rates potential hazardous waste sites utilizing the Air Force Installation Restoration Program Hazardous Assessment Rating Method (HARM) and EPA's Hazard Ranking System (HRS). Develops a statement of work for use by the client to contract for confirmation and quantification of hazardous waste sites and development of remedial action plans, and assists the client in the administration of these contracts.

Montgomery County, Maryland (1979-1986): Capital Project Coordinator

As the project manager for the development and implementation of Montgomery County's Solid Waste Disposal Program, explained the details of various solid waste disposal projects to the County Executive, County Council, senior County management, and the general public and news media; and reviewed, evaluated, and investigated concerns raised in order to resolve these concerns or justify the lack of need for concern. Established lines of communication with federal, state, regional, and local regulatory agencies, and acted as liaison with these agencies to obtain and/or defend required permits. Developed office operating budgets and CIP project descriptions, justifications, and cost estimates. Provided support to the County Attorney during

preparation for legal proceedings associated with citizen suits, contract disputes or other issues related to solid waste disposal projects, and testified on behalf of the County Government during litigation on these issues when requested or subpoenaed.

Supervised and provided engineering management and technical support in the environmental discipline and areas of contract interpretation to staff of seven professionals assigned to the $45 million short-term solid waste disposal program consisting of the planning, design and construction of a 2,000-ton/day solid waste transfer station; the design and construction of a 6-million-cubic-yard municipal solid waste sanitary landfill; the design and construction of a new road; and the planning, design, and construction of safety improvements to two existing roads. Responsibilities included the actual preparation, development, and negotiation of complex professional services contracts, construction and operating contracts, and change orders; and the supervision and approval of routine contracts and change orders developed and negotiated by project staff. Duties also included the scheduling, coordination and administration of the professional services contracts, construction contracts, and long-term operating contracts comprising the solid waste disposal program; as well as the authorization of payment requisitions and the acceptance of work performed in accordance with these contracts.

Acted as the technical director for a solid waste planning study reevaluating viable long-term solid waste disposal technologies, especially energy recovery type facilities (mass burn and RDF). Served on an interjurisdictional committee developing and awarding regional construction/operating contracts; implemented a 75,000-cubic-yard leaf composting operation; and provided County oversight of the daily operation of a regional sewerage sludge composting facility.

Fairfax County, Virginia (1975-1979): Design/Construction Coordinator

Provided liaison between the Department of Public Works and a consultant construction manager for more than $120 million of work in the overall expansion and upgrading of the County's wastewater treatment facilities to include a 36-MGD secondary and advanced treatment facility employing activated sludge; sludge incineration; flow equalization, phosphorus removal by lime precipitation, recarbonation, and recalcination, suspended solids removal by gravity filtration; organics removal by carbon adsorption; nitrogen removal by breakpoint chlorination; oxygenation; dechlorination, railroad facilities for chemical transportation and off-loading; and standby power generation and four major wastewater conveyance systems with five pump stations (6- to 50-MGD capacity), force mains and gravity sewers including approximately 4,000 feet of tunnels and an inverted syphon. Responsibilities included the overall supervision of the EPA Construction Grant Program; the preparation and updating of the Capital budgets; the preparation, negotiation, and administration of design and construction contracts; the detailed review of all facets of the design/construction activities; and meeting with regulatory agencies, concerned citizens, and the general public to explain the projects.

Washington Suburban Sanitary Commission (1972-1975): Project Manager

Supervised and coordinated the total project design efforts of the design engineers and other consultants for the upgrading and expansion of the Potomac River Water Filtration Plant and the Patuxent Water Filtration Plant. Project managerial duties included the preparation and administration of engineering contracts; the development of design and environmental assessment scopes of work; the coordination and approval of project designs, specifications, bid documents, and shop drawings; and the presentation of project designs to governmental agencies, environmental organizations, and all other concerned citizens.

Pennsylvania Department of Transportation (summers 1970-1972): Civil Engineer Trainee

Duties included assisting the resident engineer in the inspection of all phases of highway and bridge construction including the placing of bridge decks and roadway pavements.

Washington Suburban Sanitary Commission (summer 1969): Engineering Aide

As an engineering aide in the Capital Improvement Planning (CIP) Office, provided preliminary research to determine location, year required, and size and cost of future water and sewer line projects.

Appendix B
Interviewee Information

MARTIN AIR NATIONAL GUARD STATION
GADSDEN MUNICIPAL AIRPORT, GADSDEN, ALABAMA

INTERVIEWEE INFORMATION

Interviewee Number	Primary Duty Assignment	Years Associated with Martin ANGS
1	Power Production	25
2	Administrative	-
3	Administrative	-
4	Administrative	-

Appendix C
Outside Agency Contact List

OUTSIDE AGENCY CONTACT LIST

1. United States Department of the Interior
   Fish and Wildlife Service
   Jackson Mall Office Center
   300 Woodrow Wilson Avenue
   Suite 316
   Jackson, Mississippi 39213
   601-965-4900

2. Department of the Army
   United States Army Engineers District, Mobile
   P.O. Box 2288
   Mobile, Alabama 36628-0001
   205-694-3781

3. Federal Emergency Management Agency
   Flood Map Distribution Center
   6930 (A-F) San Tomas Road
   Baltimore, Maryland 21227-6227
   800-492-6605

4. Geological Survey of Alabama
   420 Hackberry Lane
   P.O. Box 0
   Tuscaloosa, Alabama 35486
   205-349-2852

Appendix D
USAF Hazard Assessment Rating Methodology

USAF HAZARD ASSESSMENT RATING METHODOLOGY

The Department of Defense (DoD) has established a comprehensive program to identify, evaluate, and control problems associated with past disposal practices at DoD facilities. One of the actions required under this program is to:

> develop and maintain a priority listing of contaminated installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts. (Reference: DEQPPM 81-5, 11 December 1981).

Accordingly, the United States Air Force (USAF) has sought to establish a system to set priorities for taking further actions at sites based upon information gathered during the Records Search phase of its Installation Restoration Program (IRP).

PURPOSE

The purpose of the site rating model is to provide a relative ranking of sites of suspected contamination from hazardous substances. This model will assist the Air National Guard in setting priorities for follow-on site investigations.

This rating system is used only after it has been determined that (1) potential for contamination exists (hazardous wastes present in sufficient quantity), and (2) potential for migration exists. A site can be deleted from consideration for rating on either basis.

DESCRIPTION OF MODEL

Like the other hazardous waste site ranking models, the U.S. Air Force's site rating model uses a scoring system to rank sites for priority attention. However, in developing this model, the designers incorporated some special features to meet specific DoD program needs.

The model uses data readily obtained during the Records Search portion (Phase I) of the IRP. Scoring judgment and computations are easily made. In assessing the hazards at a given site, the model develops a score based on the most likely routes of contamination and the worst hazards at the site. Sites are given low scores only if there are clearly no hazards. This approach meshes well with the policy for evaluating and setting restrictions on excess DoD properties.

Site scores are developed using the appropriate ranking factors according to the method presented in the flow chart (Figure 1 of this report). The site rating form and the rating factor guideline are provided at the end of this appendix.

As with the previous model, this model considers four aspects of the hazard posed by a specific site: possible receptors of the contamination, the waste and its characteristics, the potential pathways for contamination migration, and any efforts that were made to contain the wastes resulting from a spill.

The receptors category rating is based on four rating factors: the potential for human exposure to the site, the potential for human ingestion of contaminants should underlying aquifers be polluted, the current and anticipated uses of the surrounding area, and the potential for adverse effects upon important biological resources and fragile natural settings. The potential for human exposure is evaluated on the basis of the total population within 1,000 feet of the site, and the distance between the site and the base boundary. The potential for human ingestion of contaminants is based on the distance between the site and the nearest well, the groundwater use of the uppermost aquifer, and population served by the groundwater supply within 3 miles of the site. The uses of the surrounding area are determined by the zoning within a 1-mile radius. Determination of whether or not critical environments exist within a 1-mile radius of the site predicts the potential for

adverse effects from the site upon important biological resources and fragile natural settings. Each rating factor is numerically evaluated (0-3) and increased by a multiplier. The maximum possible score is also computed. The factor score and maximum possible scores are totaled, and the receptors subscore computed as follows: receptors subscore = (100 x factor score subtotal/ maximum score subtotal).

The waste characteristics category is scored in three steps. First, a point rating is assigned based on an assessment of the waste quantity and the hazard (worst case) associated with the site. The level of confidence in the information is also factored into the assessment. Next, the score is multiplied by a waste persistence factor, which acts to reduce the score if the waste is not very persistent. Finally, the score is further modified by the physical state of the waste. Liquid wastes receive the maximum score, while scores for sludges and solids are reduced.

The pathways category rating is based on evidence of contaminant migration or an evaluation of the highest potential (worst case) for contaminant migration along one of three pathways: surface-water migration, flooding, and groundwater migration. If evidence of contaminant migration exists, the category is given a subscore of 80 to 100 points. For indirect evidence, 80 points are assigned, and for direct evidence, 100 points are assigned. If no evidence is found, the highest score among the three possible routes is used. The three pathways are evaluated and the highest score among all four of the potential scores is used.

The scores for each of the three categories are added together and normalized to a maximum possible score of 100. Then the waste management practice category is scored. Scores for sites with no containment are not reduced. Scores for sites with limited containment can be reduced by 5 percent. If a site is contained and well managed, its score can be reduced by 90 percent. The final site score is calculated by applying the waste management practices category factory to the sum of the scores for the other three categories.

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE _____

LOCATION _____

DATE OF OPERATION OR OCCURRENCE _____

OWNER/OPERATOR _____

COMMENTS/DESCRIPTION _____

SITE RATED BY _____

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site		4		
B. Distance to nearest well		10		
C. Land use/zoning within 1 mile radius		3		
D. Distance to installation boundary		6		
E. Critical environments within 1 mile radius of site		10		
F. Water quality of nearest surface water body		6		
G. Ground water use of uppermost aquifer		9		
H. Population served by surface water supply within 3 miles downstream of site		6		
I. Population served by ground-water supply within 3 miles of site		6		
		Subtotals	_____	_____

Receptors subscore (100 X factor score subtotal/maximum score subtotal) _____

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) _____
2. Confidence level (C = confirmed, S = suspected) _____
3. Hazard rating (H = high, M = medium, L = low) _____

Factor Subscore A (from 20 to 100 based on factor score matrix) _____

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

_____ X _____ = _____

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

_____ X _____ = _____

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore _____

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water		8		
Net precipitation		6		
Surface erosion		8		
Surface permeability		6		
Rainfall intensity		8		
		Subtotals	_____	_____

Subscore (100 X factor score subtotal/maximum score subtotal) _____

2. Flooding

		1		

Subscore (100 X factor score/3) _____

3. Ground water migration

Depth to ground water		8		
Net precipitation		6		
Soil permeability		8		
Subsurface flows		8		
Direct access to ground water		8		
		Subtotals	_____	_____

Subscore (100 X factor score subtotal/maximum score subtotal) _____

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore _____

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors _____
Waste Characteristics _____
Pathways _____

Total _____ divided by 3 = _____

Gross Total S

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

_____ X _____ = [ ]

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDELINES

I. RECEPTORS CATEGORY

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
A. Population within 1,000 feet (includes on-base facilities)	0	1-25	26-100	Greater than 100	4
B. Distance to nearest water well	Greater than 3 miles	1 to 3 miles	3,001 feet to 1 mile	0 to 3,000 feet	10
C. Land Use/Zoning (within 1-mile radius)	Completely remote (zoning not applicable)	Agricultural	Commercial or Industrial	Residential	3
D. Distance to installation boundary	Greater than 2 miles	1 to 2 miles	1,001 feet to 1 mile	0 to 1,000 feet	6
E. Critical environments (within 1-mile radius)	Not a critical environment	Natural areas	Pristine natural areas; minor wetlands; preserved areas; presence of economically important natural resources susceptible to contamination	Major habitat of an endangered or threatened species; presence of recharge area; major wetlands	10
F. Water quality/use designation of nearest surface water body	Agricultural or industrial use	Recreation, propagation and management of fish and wildlife	Shellfish propagation and harvesting	Potable water supplies	6
G. Ground-water use of uppermost aquifer	Not used, other sources readily available	Commercial, industrial, or irrigation, very limited other water sources	Drinking water, municipal water available	Drinking water, no municipal water available; commercial, industrial, or irrigation, no other water source available	9
H. Population served by surface water supplies within 3 miles downstream of site	0	1-15	51-1,000	Greater than 1,000	6
I. Population served by aquifer supplies within 3 miles of site	0	1-50	51-1,000	Greater than 1,000	6

II. WASTE CHARACTERISTICS

A-1 Hazardous Waste Quantity

S = Small quantity (5 tons or 20 drums of liquid)
M = Moderate quantity (5 to 20 tons or 21 to 85 drums of liquid)
L = Large quantity (20 tons or 85 drums of liquid)

A-2 Confidence Level of Information

C = Confirmed confidence level (minimum criteria below)

- Verbal reports from interviewer (at least 2) or written information from the records
- Knowledge of types and quantities of wastes generated by shops and other areas on base

S = Suspected confidence level

- No verbal reports or conflicting verbal reports and no written information from the records
- Logic based on a knowledge of the types and quantities of hazardous wastes generated at the base, and a history of past waste disposal practices indicate that these wastes were disposed of at a site

A-3 Hazard Rating

Rating Factors	Rating Scale Levels			
	0	1	2	3
Toxicity	Sax's Level 0	Sax's Level 1	Sax's Level 2	Sax's Level 3
Ignitability	Flash point greater than 200°F	Flash point at 140°F to 200°F	Flash point at 80°F to 140°F	Flash point less than 80°F
Radioactivity	At or below background levels	1 to 3 times background levels	3 to 5 times background levels	Over 5 times background levels

Use the highest individual rating based on toxicity, ignitability and radioactivity and determine the hazard rating.

Hazard Rating	Points
High (H)	3
Medium (M)	2
Low (L)	1

II. WASTE CHARACTERISTICS--Continued

Waste Characteristics Matrix

Point Rating	Hazardous Waste Quantity	Confidence Level of Information	Hazard Rating
100	L	C	H
80	L	C	M
	M	C	H
70	L	S	H
60	S	C	H
	M	C	M
	L	S	M
50	L	C	L
	M	S	H
	S	C	M
	S	S	H
40	M	S	M
	M	C	L
	L	S	L
	S	C	L
30	M	S	L
	S	S	M
20	S	S	L

Notes:
For a site with more than one hazardous waste, the waste quantities may be added using the following rules:

Confidence Level
- o Confirmed confidence levels (C) can be added.
- o Suspected confidence levels (S) can be added.
- o Confirmed confidence levels cannot be added with suspected confidence levels.

Waste Hazard Rating
- o Wastes with the same hazard rating can be added.
- o Wastes with different hazard ratings can only be added in a downgrade mode, e.g., MCM + SCH = LCM if the total quantity is greater than 20 tons.

Example: Several wastes may be present at a site, each having an MCM designation (60 points). By adding the quantities of each waste, the designation may change to LCM (80 points). In this case, the correct point rating for the waste is 80.

B. Persistence Multiplier for Point Rating

Persistence Criteria	Multiply Point Rating From Part A by the Following
Metals, polycyclic compounds, and halogenated hydrocarbons	1.0
Substituted and other ring compounds	0.9
Straight chain hydrocarbons	0.8
Easily biodegradable compounds	0.4

C. Physical State Multiplier

Physical State	Multiply Point Total From Parts A and B by the Following
Liquid	1.0
Sludge	0.75
Solid	0.50

III. PATHWAYS CATEGORY

A. Evidence of Contamination

Direct evidence is obtained from laboratory analyses of hazardous contaminants present above natural background levels in surface water, ground water, or air. Evidence should confirm that the source of contamination is the site being evaluated.

Indirect evidence might be from visual observation (i.e., leachate), vegetation stress, sludge deposits, presence of taste and odors in drinking water, or reported discharges that cannot be directly confirmed as resulting from the site, but the site is greatly suspected of being a source of contamination.

B-1 Potential for Surface Water Contamination

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
Distance to nearest surface water (includes drainage ditches and storm sewers)	Greater than 1 mile	2,001 feet to 1 mile	501 feet to 2,000 feet	0 to 500 feet	8
Net precipitation	Less than -10 inches	-10 to +5 inches	+5 to +20 inches	Greater than +20 inches	6
Surface erosion	None	Slight	Moderate	Severe	8
Surface permeability	0% to 15% clay ($>10^{-2}$ cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	Greater than 50% clay ($>10^{-6}$ cm/sec)	6
Rainfall intensity based on 1-year 24-hour rainfall (Thunderstorms)	<1.0 inch 0-5 0	1.0 to 2.0 inches 6-35 30	2.1 to 3.0 inches 36-49 60	>3.0 inches >50 100	8

B-2 Potential for Flooding

Floodplain	Beyond 100-year floodplain	In 100-year floodplain	In 10-year floodplain	Floods annually	1

B-3 Potential for Ground-Water Contamination

Depth to ground water	Greater than 500 feet	50 to 500 feet	11 to 50 feet	0 to 10 feet	8
Net precipitation	Less than -10 inches	-10 to +5 inches	+5 to + 20 inches	Greater than +20 inches	6
Soil permeability	Greater than 50% clay ($>10^{-6}$ cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	0% to 15% clay ($<10^{-2}$ cm/sec)	8

B-3 Potential for Ground-Water Contamination--Continued

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
Subsurface flows	Bottom of site greater than 5 feet above high ground-water level	Bottom of site occasionally submerged	Bottom of site frequently submerged	Bottom of site located below mean ground-water level	8
Direct access to ground water (through faults, fractures, faulty well casings, subsidence, fissures, etc.)	No evidence of risk	Low risk	Moderate risk	High risk	8

IV. WASTE MANAGEMENT PRACTICES CATEGORY

A. This category adjusts the total risk as determined from the receptors, pathways, and waste characteristics categories for waste management practices and engineering controls designed to reduce this risk. The total risk is determined by first averaging the receptors, pathways, and waste characteristics subscores.

B. Waste Management Practices Factor

The following multipliers are then applied to the total risk points (from A):

Waste Management Practice	Multiplier
No containment	1.0
Limited containment	0.95
Fully contained and in full compliance	0.10

Guidelines for fully contained:

Landfills:

- o Clay cap or other impermeable cover
- o Leachate collection system
- o Liners in good condition
- o Adequate monitoring wells

Surface Impoundments:

- o Liners in good condition
- o Sound dikes and adequate freeboard
- o Adequate monitoring wells

Spills:

- o Quick spill cleanup action taken
- o Contaminated soil removed
- o Soil and/or water samples confirm total cleanup of the spill

Fire Protection Training Areas:

- o Concrete surface and berms
- o Oil/water separator for pretreatment of runoff
- o Effluent from oil/water separator to treatment plant

General Note: If data are not available or known to be complete the factor ratings under items I-A through I, III-B-1, or III-6-3, then leave blank for calculation of factor score and maximum possible score.

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